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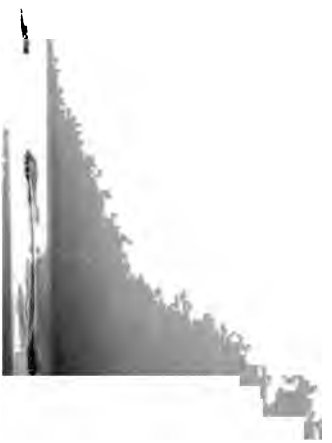
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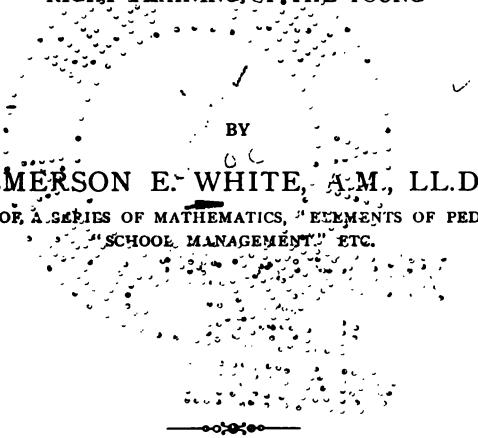


THE

ART OF TEACHING

A Manual

FOR TEACHERS, SUPERINTENDENTS, TEACHERS' READING CIRCLES, NORMAL SCHOOLS, TRAINING CLASSES, AND OTHER PERSONS INTERESTED IN THE RIGHT TRAINING OF THE YOUNG



BY

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TO

The Many Thousands of Teachers

WHO IN THE PAST THIRTY YEARS HAVE LISTENED
WITH KIND APPRECIATION TO THE AUTHOR'S
LECTURES ON THE PRINCIPLES AND
METHODS OF TEACHING

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PREFACE.

THIS is not a treatise on education, or even on school education. Its purpose is limited to the study of *one* of the arts included in school education, — *the art of teaching*. Teaching is only a part of the comprehensive function of the school, but it is a very important part, and its mastery is essential to success in school training. The narrower field has been chosen that its survey may be definite and helpful.

An obvious advantage in the separate treatment of the art of teaching is its practical removal from the domain of philosophy, and, especially, the uncertain philosophy of education. Many conscientious teachers have been baffled in their earnest but vain attempts to apply some new philosophy of education in the details of actual teaching. It can but afford needed relief for such teachers to see clearly that philosophy sheds no helpful light on the teaching process, the ends to be realized being *subjective* and *immediate*, not objective and ultimate. The guiding principles of the art of teaching are chiefly derived from psychology, and happily from its *facts*.

In the study of methods it has been the author's aim to treat thoroughly and practically those that are generic and comprehensive, presenting them in the light of the fundamental principles of teaching and also in the light of the best practical experience. Special pains

have been taken to point out the functions and limitations of special methods, and this with the view of guarding teachers against the error of accepting them as general methods, and making them hobbies.

But the treatise is not a manual of methods and devices. It is increasingly clear that what is needed to attain higher success in teaching is not the copying of pattern methods, but a clear grasp by teachers of the fundamental principles of their art, and a more intelligent and conscientious application of these guiding principles in practice. The vital need of school training is *to be grounded.* To this end it has been the author's earnest endeavor to present what is fundamental in the art of teaching in a clear, practical, and helpful manner.

The present volume supplements the author's earlier treatise, the ELEMENTS OF PEDAGOGY, which has been so widely useful in establishing sound principles of teaching. It is also the complement of the author's SCHOOL MANAGEMENT, chiefly devoted to school organization and discipline and moral training; and it is hoped that it may be at least equally useful in the improvement of school training. The two volumes present the two most important elements in school education.

COLUMBUS, OHIO.

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THE ART OF TEACHING.

CHAPTER I.

INTRODUCTION.

EDUCATION is a complex process. In its widest sense it includes all those processes, activities, and influences that occasion subjective changes in man, whether these changes are physical, mental, moral, or spiritual. The home, the school, the church, civil society, the state, industry, physical environment, and all else that touches man, are, in this wide sense, educational agencies, and each contributes something to the complex result called education. Education Defined.

"Men are educated," says Dr. Fitch, of England, "from infancy to the grave by all the sights and sounds, the joys and sorrows, which they encounter, by the character and behavior of their friends, the nature of their surroundings, and by the books they read."

"In its largest acceptance," says John Stuart Mill, "education comprehends even the indirect effects produced on character and on the human faculties by things the direct purposes of which are different, by laws, by forms of government, by the industrial arts, by modes of social life; even by physical facts not dependent on the human will, by climate, soil, and local position."

Dr. W. T. Harris defines education as "that development of the individual, effected through his intellect and will, which enables him to combine with his fellow-men helpfully in performing the functions of the institutions of society, family, civil society, state, and church, only a part, although an important part, of this education being received in the school; other essential parts being received through the family, the industrial community, the political state, and the church."

Dr. B. A. Hinsdale defines education in its widest sense as "the process of transformation wrought in a man by all the agents and powers of whatever kind that act on him from the cradle to the grave."

It is thus seen that the term *education* has, in its widest significance, a large and indefinite content,— so large, indeed, that no writer on education has been able to get anything helpful out of it. In order to treat education either scientifically or practically, the term must be used in a more limited and definite sense. Mr. Mill narrows the term to include "whatever we do for ourselves, and whatever is done for us by others, for the express purpose of bringing us nearer to the perfection of our nature;" and then, for his immediate purpose (the St. Andrews address), he limits the term to "the culture which each generation purposely gives to those who are to be its successor in order to qualify them for at least keeping up and, if possible, for raising the improvement which has been attained."

More Limited Meaning.

"Education in its ideal or formal aspect," says Dr. W. H. Payne, "aims at the realization of the typical man, and comprises all the agencies that can be brought under human control for the attainment of this end;" but, as a basis for the science of pedagogy, he narrows

the term to so much of the art of education "as falls within the province of the school."

But even school education is a very complex process, including as it does all the activities and influences that enter into school life. Some of these factors are designed and purposely directed; others are spontaneous, and still others are personal and unconscious, as the influence of teacher and fellow-pupils, physical environment, etc. Dr. Bain found that education limited to the work of the school needed "a little more paring and rounding to give it scientific form," and so in his "Science of Education" he treats education "as the arts and methods employed by the school master." **School Education.**

Most writers on education dodge all attempts at definition. To the reader is left the discovery of the sense in which the term is used, not always an easy task, and especially when the term is used by the same writer in different senses. Instead of definition, writers on the philosophy of education usually work from some ultimate end to be attained, as "the harmonious and equable evolution of the human powers"; "the preparation of man for complete living"; "the moral revelation of the world," etc.

The term *teaching* has a much narrower meaning than education; much narrower than school education; narrower, indeed, than school training. Teaching is one of the arts included in education. Teaching may be defined as the occasioning of those activities in the learner that result in knowledge, power, and skill. This is the definite sense in which the word is used when one speaks of teaching history or botany or the arts of reading, writing, language, etc. Teach- **Teaching Defined.**

ing always involves two factors, a teacher and a pupil, the latter endowed with the power of responsive activity, as well as self-activity, and hence *teachable.* The teacher may act upon the pupil directly, in person; or indirectly, as by means of a book. The determining element in the teaching process is the *pupil's activity.* The teacher is only the occasioner of this activity. It is thus seen that teaching is only a part of school education. It is, however, an important part, and its mastery is essential to success in school work.

Teaching as an Art.

It is not meant that the teaching process is in practice always separate from the other elements of school training. This is no more true than that memory or emotion is a separate state of consciousness. There are, however, most important pedagogical advantages in the separate consideration of teaching as an art. Among these advantages is the fact that teaching is thus practically removed from the domain of philosophy, and especially the uncertain philosophy of education.

Function of Philosophy.

Philosophy seeks ultimate ends, universal principles, and these are too remote and comprehensive to be a practical guide in any of the definite arts, and particularly the art of teaching. "Philosophy bakes no bread." It may determine the ultimate ends of human existence, and the knowledge essential to their realization, but it cannot tell *how this knowledge can be taught.* The method of teaching a human mind knowledge involves the process by which the mind acquires such knowledge, and for this we must go to psychology. Philosophy has its pedagogic value in determining the ultimate ends of education, and thus the general function of the school, its general course of

study, etc., but it throws little light upon the teaching process. "No philosophical study of ultimate questions," says Professor Royce of Harvard University, "has any direct bearing upon the technical problems of educational methods or upon the similarly practical problems of any other art." It seems increasingly clear that the so-called philosophies of education, now clamoring for recognition, will never prove a helpful guide in the art of teaching, whatever may be their value in the other functions of the school, and whatever may be their scholastic value to the student.

Philosophy and Art.

It may be true that philosophy is far-reaching enough to touch all human conduct and endeavor; that "one's view of the world" is really embodied in his life. It does not, however, follow that all men have an intelligent view of the world, much less are consciously conforming their lives to such a view. It is certain that the arts are not thus guided. It is more poetic than true to say that the shoemaker's view of the world shapes his last and guides the process of making a shoe. The same is true in the art of teaching. The ends that guide in the teaching process are *immediate*, not ultimate, and the highest success may be reached in the absence of philosophic knowledge.

Philosophy and Science.

The principles on which the art of teaching is based are scientific. Every branch of knowledge, every art, has its principles, its *science*, and so there are many sciences. Thus we have a science of chemistry, a science of mathematics, a science of music, etc. Philosophy seeks for the ultimate unity, the final cause of all science, and hence there are many sciences, but only *one* true philosophy.

Philosophy is what Fichte aptly calls "the science of science."

It is fortunate that the guiding principles of the teaching art are not the ultimates of philosophy, for few teachers are capable of grasping, much less of applying, such principles. Philosophic insight is the highest form of the reason, and without this insight philosophy is empty and vain. Certainly no teacher is helped by familiarity with philosophic terms and phrases which have no definite content. On the contrary, many earnest teachers have been confused and muddled by attempts to embody some new philosophy of education in actual teaching. Moreover, if philosophy were the only practical guide in teaching, only philosophers could be successful teachers, and this would seem to exclude those who do not know the *true* philosophy; and who can be certain here? The history of philosophy presents one continued struggle of philosophic systems, one philosophy succeeding another, the newer often returning to the older, thus presenting what has been aptly termed "the cycles of philosophy." Several distinct schools of philosophy are now contending for the control of American education.

Philosophic Insight.

We are not discrediting the value of philosophy in determining the ultimate ends and function of school education. All *systems* of education are based on some philosophic end, and there may be as many systems as there are ends that can be made philosophic ultimates. The acceptance of a wrong end results in a wrong system of education; and the acceptance of narrow and partial ends results in narrow and partial systems. Indeed, all partial systems

Value of Philosophy.

of education have their origin in the acceptance of a partial end as an ultimate. Shallow philosophizing is the source of hobbies and fads. Our earnest contention is that philosophy throws no guiding light on the teaching process. What could be done in actual teaching with the philosophic principle (if it be one) that "the end of education is to put man in right relations to the universe"? The results of the teaching art are wrought *in the pupil*,[1] and hence they are subjective and immediate — not objective and ultimate. In actual teaching, even the philosopher must set before himself and strive to attain immediate ends.

We thus reach the important fact that *the guiding principles of the teaching art are derived from psychology, and happily from its facts.* It will be shown later that these principles can be clearly stated and intelligently applied.

It may be objected that the necessary psychical facts for a science of teaching are not yet known; that the advent of such a science must wait for a new psychology. It is not claimed that all psychical facts are now known; that there is nothing more to be learned in psychology. Not only experiment and observation but introspection may add new facts and widen and otherwise modify facts now known. Psychology is a progressive science; but it is now a science, and as such presents a body of facts respecting physical activity and growth of fundamental importance in education. To assert the contrary is to raise a strong presumption that there will never be such a science as psychology,

Science of Psychology.

[1] "Each object and each situation, every act of man and every refusal to act causes *a reaction in the soul educative in its effect.*" — DR. W. T. HARRIS in "Psychologic Foundations of Education."

and, as a consequence, there will never be a psychical basis for the art of teaching.

No New Psychology.

No one of the new methods of psychical research has set aside a psychical fact discovered by introspection and attested by experience, and no objective or physiological discovery has dimmed the clear light of consciousness. While new facts are discovered, the certitude of the facts of consciousness remains unimpeached. Modern psychologists who have given much attention to the so-called physiological psychology, are now affirming that the physiological laboratory is not discrediting or superseding the ascertained facts of consciousness; that there is no new psychology in the sense in which the term is often used. The term *new* when applied to psychology is inclusive of the old, not exclusive. The new psychology includes the facts of consciousness or it has no message.

In the introductory chapter of his "Talks to Teachers on Psychology," Professor William James, of Harvard University, says: —

> "So I say at once that in my humble opinion there is no new psychology worthy of the name. There is nothing but the old psychology, which began in Locke's time, plus a little physiology of brain and sense and theory of evolution and a few refinements of introspective detail for the most part without adaptation to the teacher's use. It is only the fundamental conceptions of psychology which are of real value to the teacher, and they, apart from the aforesaid theory of evolution, are very far from being new."

Professor Royce, of Harvard University, bears similar testimony. In an able paper read before the National Council of Education in 1898 he shows that psychology was never exclusively introspective, while introspection is a notable factor in the psychology of

to-day.[1] The "psychology of the armchair" is largely a figment of the imagination.

Modern psychology is an organization of psychical facts, whether old or new, and howsoever ascertained. Such modern psychologists as Porter, Hoffding, Ladd, and James survey the entire field of psychical research. Whatever is known of the activities, growth, states, and susceptibilities of the human soul is appropriated by modern psychology. Hence its value as a basis for the science of education, and especially for the science of teaching. From the psychical facts thus presented it is not difficult to derive fundamental principles of teaching, principles which constitute a science of teaching and are guiding and fruitful in practice. Even Professor Münsterberg, of Harvard, who is bearing such emphatic and repeated testimony against the value of the laboratory study of physiological psychology to the teacher in actual school work, admits that psychology has "some of its best fruits for the work of education." Whatever may be the practical value of laboratory psychical research to the teacher, the known facts of psychology are undeniably of great value in determining the guiding principles of the teaching art.

Modern Psychology.

There is nothing gained in pedagogy by attempts to make distinctions in the value of different kinds of psychical knowledge. Whether psychical facts belong to rational psychology or empirical psychology or physiological psychology is not material, *provided they are facts*, and as such are attested by consciousness and experience.

Value of Psychical Knowledge.

[1] Proceedings of the National Educational Association, Washington, D.C., 1898, pp. 554–570.

It is not claimed that the principles of teaching are all derived from psychology. While this furnishes what may be called the *basal* principles of the teaching art, other principles of practical value are furnished by other sciences.

Ethics.

The science of ethics sheds a clear light upon the training of the will, including the use of motives, the freedom of the will, etc. Whatever may be true of the influence of true methods of teaching on moral character, it is certain that ethical conditions modify intellectual training and limit its efficiency. Indeed, the psychology from which the art of teaching derives its guiding principles clearly includes the science of ethics.

Physiology.

Modern physiology includes facts that condition and limit psychical as well as physical activity, and so have an important place in the science of teaching. Physiological research is adding to our knowledge these and other facts that must be considered in school training. It is increasingly seen that physiology has a message of great value in pedagogy. But it must ever be remembered that psychical and physiological facts are not identical. No fact is both psychical and physiological, though the one may be related to the other. The phenomena of the human body may be susceptible of physical testing and measurement, but psychical phenomena have no material quality or equivalent. Ideas, feelings, and purposes cannot be measured like physical substances and energies. Professor Münsterberg and other psychologists have clearly shown that psychical and physical phenomena have no common quality or measure.

The value of psychology as a guide in teaching is at present most evident in primary instruction. The recent happy changes in methods of teaching young children have been effected in the light of a truer knowledge of child life, or, if preferred, a truer child psychology. Pestalozzi, Froebel, and other reformers of elementary education derived their principles from what they believed to be known of the activity and development of the soul in childhood.

Primary Instruction.

The difference between primary and advanced methods of teaching correspond to the difference in what Professor James calls "the behavior of the mind" in childhood and adult life. No psychical theory has been the source of more error in teaching than the assumption that the mind of a child differs from the mind of an adult in no respect except in strength; that children are little adults. This led to the old pedagogical error that young pupils in the primary school may be taught the same kinds of knowledge and in essentially the same way as pupils in the high school; that the only real difference between primary and advanced methods of teaching is the length of lessons; that is, the *amount* of knowledge taught in a given exercise.

Primary and Advanced Methods.

There is a surprising revival of this serious error in the recent tendency to force down into lower grades subjects that have taxed the powers of much older pupils. What is needed to correct this unwise tendency is a clearer recognition of the fact that the mind of the child differs from the mind of the adult, not simply in strength, but in the *relative* activity and energy of the several mental powers; the perceptive powers, for example, being more

Unwise Tendency.

active in infancy than the thought powers.[1] The mental condition of pupils as they advance from the kindergarten to the high school is characterized by changes in the relative activity of the several mental powers.

It is evident that methods and processes of teaching must be adapted to these psychical changes; and here the vital question is not what pupils can be forced or trained to do in the successive grades, but *what they ought to do* in their psychical and physical condition. It follows that true primary methods of teaching involve a knowledge of the psychical as well as the physical nature of children.

Adaptation to Changes.

It is a question whether observation or insight has contributed most to this knowledge. What is known as child study has no meaning except as the phenomena observed are *correctly interpreted*, and this can be done only in the clear light of consciousness; and here insight is more important than outsight. The biographers of Froebel leave no doubt that his marvelous insight into child nature was made possible by the memories of his own childhood. It seems probable that Froebel's memory put back in time some of the experiences of his early youth, otherwise he was an extraordinary child. Few memories of the first four years of infancy appear in later consciousness, few associations being possible.[2] Not only is this true, but, as a consequence, it is difficult to interpret the observations on children made at this early age, and much more difficult to make them the basis of a scientific generalization. Moreover, it is not possible to apply what is shown in one period

Child Study.

[1] "Elements of Pedagogy," pp. 84–93.

[2] "We have a large group of psychic facts that vanish long before maturity is attained, and leave no sign." — DR. G. STANLEY HALL.

of child life to another period. The changes in child experiences are too great. It is doubtful whether the psychic manifestations of children before the age of five throw any clear light on the period of school training.

It further seems evident that child study can give results of scientific value only when carried on by observers specially fitted for the difficult work. No one but a practical psychologist is competent to make a scientific study of a child, and still higher ability and attainments are required to generalize the results of such study. In an article in the *Forum* (August, 1900), Dr. G. Stanley Hall states that child study is now represented by two thousand books and articles well worth reading, "not comprising the yet larger mass of chaff." If more than half of the titles on child study are, in the judgment of so eminent an expert as Dr. Hall, "*chaff*," what must be true of the still greater mass of unpublished papers, reports, etc., which have had a hearing in the past ten years? Has any expert yet appeared who is competent to detect and weed out the errors even in the titles declared by Dr. Hall to be worth reading? To most psychologists this seems an impossible task. The only course that promises success in obtaining reliable data for scientific purposes is to exclude all observations not made by competent experts. To the lay mind there is so far small promise that child study will ever give us a new psychology, and even the promised child psychology is in the future, and seemingly not a very near future. But we are told that "this is an expert problem, and only the opinions of experts have value."

Scientific Value of Child Study.

But whatever may be true of the scientific results of child study, as now carried on, it is throwing some light,

though not always clear or certain, on the training of the young. It is doing a great service by calling needed attention to the physical defects of children, particularly those of sight and hearing, and many children thus afflicted are being relieved. It is disclosing the physical conditions of attention, the signs of fatigue,[1] and other physiological facts of practical value, and it is giving new emphasis to the old truth that a knowledge of the individual pupil, not necessarily scientific, but personal and sympathetic, must guide in his training. But the most important results yet attained are indirect and incidental. These include the changed attitude and spirit of teachers, especially primary teachers, toward their pupils, and the increased mutual interest between the home and the school.

Its Practical Value.

Since it is conceded by the best judges that the great mass of even recorded child observations are not trustworthy, it behooves teachers to be slow in their attempts to apply these observations in the training of children. It would seem wiser to wait until experts, who may be competent to separate the wheat from the chaff, have put reliable results into usable form. It will certainly be wise for teachers to pay little attention to generalizations based on syllabi averages, howsoever attractive they may appear.

Caution.

Whatever may be the sources of psychical science, its facts hold a fundamental relation to the art of teaching.

[1] The reported results of experiments to determine the facts respecting the mental fatigue of school children have been somewhat discredited by the more recent experiments of Dr. Thorndike (*Psychological Review*, November, 1900). It is doubtful whether we are yet in possession of any *new* facts of practical value in arranging the school program.

Psychology not only has light for the teacher, but its light is essential and guiding. It is an axiom of pedagogy that teaching, both in subject-matter and method, must be adapted to the capability of the learner, but such adaptation is not possible if the teacher be ignorant of the capability of his pupil. He must know not only the subject-matter to be taught, but also how the pupil can best acquire such knowledge. For these guiding facts he must go to psychology.

Axiom of Pedagogy.

Every rational method of teaching presupposes that the pupil acquires knowledge in known ways, and that the several mental powers are developed in a known order. It is not claimed that these ways and this order are perfectly known. Modern psychical research is throwing new light upon these facts, so fundamental in teaching, and there is promise of clearer and fuller knowledge. Psychology has not spoken its last word.

CHAPTER II.

ENDS IN TEACHING.

THE first question in the art of teaching is *the end to be attained.* This is not only the first but the essential question. It largely determines means and methods and is the decisive test of their value. This will be made evident by a glance at several of the more obvious relations of the ends sought to the teaching process.

1. The end to be attained in teaching *guides the process.* There can be no skill in any art in the absence of definite aims. The more clearly the end to be attained is seen, the greater the inspiring interest and the higher the skill. This is true in the simplest arts, as the pitching of a ball or a quoit, and it is eminently true in the art of teaching, the art of arts. All aimless teaching is poor, whatever may be the teacher's zeal. The end is the guiding ideal in teaching. Moreover, the result to be attained in a teaching exercise must be seen from the beginning, and every step of the process be thus guided. This will give unity to the exercise and secure concentration of effort, a necessary condition of successful teaching. Scatteration is not teaching.

End guides the Process.

As already shown (p. 10), ultimate ends may determine the comprehensive function of the school and its general course of training, but such ends are too objec-

tive and remote to enter helpfully into the teaching process. The guiding ends in teaching must be *definite*, *immediate*, and *subjective;* that is, they must be results wrought in the pupil. Moreover, they must be *true ends*. A wrong end is always subversive of effort whatever may be its skill.

Guiding Ends.

2. The end to be attained in teaching is *a measure of success*. A teaching exercise that attains the results sought is so far successful. In the absence of a definite end there can be no sure evidence of success, and, as a consequence, the satisfaction and inspiration which flow from conscious success are wanting. The teacher needs a sure and satisfying evidence of success, and this not only for encouragement, but also to make further progress possible.

Measure of Success.

It is not easy to overstate the importance of such a measure of success in teaching. At the close of every exercise the teacher needs to know whether he has succeeded or failed, and the degree of his success or failure. This is essential to the taking of the next step wisely. Aimless teaching is blind and sorry plodding. The teacher needs not only guidance, but also inspiration. In the absence of such inspiration teaching is "the sorriest of trades." It may be added that, while even the successful attainment of a wrong end in teaching is failure, the failure is in the wrong end sought, and not in its attainment.

3. The end is *the sure test of methods and devices*. The importance of such a test is obvious. Ingenious and earnest teachers are devising new ways of teaching, and many of these devices are published to help other teachers. Indeed, our present school literature is a swamp of methods and devices,

Test of Devices.

some excellent, many indifferent, and not a few silly. What is to be done with them? It would certainly be unwise for teachers to ignore what other teachers are doing to improve their work. Better methods of teaching are both possible and desirable, and whatever thought and ingenuity can do in the way of improved devices should certainly be encouraged and utilized. Every improved teaching device or appliance is a contribution to school progress.

Not by Trial.

But how is the worth of new methods and devices to be determined? Certainly, *not primarily by trial.* It is often claimed that the only test of a method or device in teaching is its actual use in the schoolroom. No test has been more misleading than this. It is marvelous what little children can be trained to do by an enthusiastic and skillful teacher. The highest interest and even enthusiasm may be awakened by exercises that violate the most fundamental principles of child training. The sorriest follies that have disgraced American teaching have come into the schools through the door of trial. Teachers were able "to work them" as mechanisms, and so they were exploited as devices that "work well."

Every true method of teaching will work well in practice under right conditions, but the primary test of its trueness must lie back of its trial. The decisive fact is not what children *can do* under skillful stimulation, but *what they ought to do*, and this cannot be determined by experiment measured by interest or zeal. It is feared that some of the experimenting on children in our schools is well-nigh criminal. It is an important function of the science of pedagogy to protect children from the experimenter in devices and fads.

The sure test of methods and devices, which should precede their actual trial, is *the crucial test of end.* Every new method or device asking for trial should be made to stand and answer at least three questions, to wit: Crucial Test of End.

1. *What is its end?* What is the result it purposes to attain? If a method or device has no definite purpose, it needs no trial to condemn it. If its end is obvious, then a second question must be put to it.

2. *Is this end a true school result?* It is clearly not enough that a teaching device has a known end. It must be a true end for the school. It must have a fruitful relation to what is to follow in the course. A device that has no vital relation to the fundamental purpose of school training has no school value. It may interest, even tip-toe, children, may "work well" as an exercise, and yet have no true place in school training. A third question remains.

3. *Is this the best way of reaching the proposed end?* It is not enough that a device be *a* way or even a *good* way of reaching a result. It should be the *best* way known to the teacher. In teaching, the best methods and devices are poor enough. Here the aim should be to "get the best," and use the best. This aim is largely personal. The teacher must seek and use the methods which are best *for him.* This involves not only the teacher's ability, training, and experience, but also the conditions that limit his work. The teacher in the rural school may be baffled by methods which may work well in the highly organized city school. The teacher in the normal school, who teaches only one subject, may successfully use devices which cannot be used by teachers who teach daily several subjects. An "Get the Best."

elaborate scientific method of teaching can be successfully used only by teachers with adequate scientific training. Not every warrior can fight in Saul's armor. Some may best use David's sling. The untrained soldier can best use a simple weapon; and the untrained teacher can best use simple methods.

Application to New Devices.

It would not be difficult to fill pages with applications of this test of end to methods and devices that have had their day or are now on trial in American schools. Many new methods now noisily exploited would fail to pass such a crucial test, if intelligently applied, and many now discarded "systems" would never have possessed the schools if they had been obliged to enter through such a door. The path of school progress is strewn with discarded hobbies which in their day had no true or even definite school purpose, no merit, indeed, but novelty. Unpedagogical devices have appeared in every branch of study and in every school art. They have abounded in reading and arithmetic. There will be opportunity later to apply this decisive test of end to several methods and devices now or recently claiming attention.

A Trinity of Ends.

Three Fundamental Ends.

While teaching exercises have their special ends, no two being precisely the same, these apparently numerous results all fall into three distinct classes, which may be designated as *knowledge*, *power*, and *skill*. Every true teaching exercise has one or more of these results in some form as its end or purpose; and hence they are properly regarded as *the three fundamental ends of teaching*. These three ends may be studied separately with great practical advantage,

and guiding principles of teaching may thus be discovered. It is fortunate that the fundamental ends of teaching are so few in number, for in multiplicity of aims general principles and methods are likely to be lost.

1. One of the fundamental ends to be attained in teaching is *knowledge*; that is, to lead the pupil to know something which the teacher desires him to know. The teaching process is complete when the pupil has acquired the desired knowledge. Knowledge is acquired by the act of knowing, and hence to occasion this knowing activity is the purpose of the teaching process. This is true whatever be the nature of the knowledge taught, whether so-called "real" knowledge or information; whether original knowledge or recorded knowledge.

Knowledge.

It ought to go without saying that the more clearly and definitely the knowledge taught is known by the teacher, the more skillful and effective will be the teaching. Knowledge cannot be taught by one who does not himself know what he essays to teach. The first requisite in successful teaching is a thorough and fresh knowledge of the subjects taught, a principle that must be assumed in all consideration of methods.

Teacher's Knowledge.

This is not the place to enter upon a discussion of the kinds of knowledge that should be taught in school. This question properly belongs to the course of study, and this involves a consideration of the more ultimate ends of school education. It must suffice to say here that a true course of school instruction includes, (1) knowledge necessary as a means of acquiring other knowledge, that is, *elementary knowledge;* (2) knowledge useful *for guidance in life's activi-*

Kinds of Knowledge.

ties and duties; and (3) knowledge which is *a source of human happiness*, a means of increasing human enjoyment.

Since knowledge has its successive phases, corresponding to the phases of knowing, the elementary facts in every branch must be known before the higher or more advanced knowledge can be taught or acquired. The elementary school is the place where the pupils should acquire primary ideas and facts, and on the clearness and accuracy of this elementary knowledge will largely depend their future progress.

Utility of Knowledge.

The utility of knowledge for guidance in life is a much wider question than the practical value of its facts in the work of life, "in getting a living." The pupil is to be more than an artisan, more than a winner of food, clothing, and shelter. He is also to be the head and guide of the family, a member of society, a citizen of the state, a subject of divine government, and out of these relations flow obligations and duties of the highest importance. The knowledge taught in school must promote not only physical, but also moral, social, and civil well-being, and it must guide and inspire man in the discharge of life's higher as well as lower duties.[1]

2. Another end of teaching is *the development of power.* The term *power* may include physical or mental

[1] These diversions have been made to bear testimony against that narrow utilitarianism which is clamoring for the grooving of school training to life's toil; which would exclude from the school all training that seeks to exalt and enrich human life. The American school faces a civilization which confronts man with interests and duties demanding not only wide information, but powers equal to the great problems that press upon him for solution, a civilization in which intelligence and righteousness are vital, and character the supreme need.

or moral or spiritual power, but, for our present purpose, the term is used chiefly in the sense of mental or intellectual power. But even mental power is too general in its meaning to serve as a guide in a teaching process. The teacher must have in mind the special power to be developed, or, what may be clearer, the special direction in which mental power is to be trained. There is little helpful guidance in the vague notion that the purpose of a teaching exercise is to develop mental strength or bigness. A training exercise must be guided by an aim more definite than this. Indefinite activity does not give definite power.

Mental Power.

While there are many special directions in which power may be trained in a teaching exercise, there are three directions of fundamental importance. These are (1) the acquisition of knowlege, by observation and thought; (2) the expression of knowledge by language, drawing, etc.; and (3) its application or use. So far as the training of power is related to knowledge, it takes the direction of *acquisition* or *expression* or *application.* A given teaching exercise may in its progress take all three of these directions, and will usually take the first two, but one should be the leading or central aim.

Three Directions.

The principles that guide in the development of power in these three directions will be presented in the next chapter. It must suffice here to say that the power to acquire knowledge is trained only *by acquiring knowledge*, and the clearer the knowledge acquired, the more fruitful will be the training. The power to know is not trained by mental tiptoeing that reaches nothing or by repeating words that express only another's knowledge. The power to acquire

Power to acquire Knowledge.

knowledge from books is trained by book study and mastery.

Power to express Knowledge.

The special weakness of the old-time school was its failure to train its pupils in the clear expression of their knowledge. They memorized and repeated language, but had little training in telling what they knew in their own words. This weakness still exists in the schools, though there has been encouraging improvement in language training in recent years. The examiners of applicants for admission to our colleges bear testimony to the inability of many of these applicants to tell or to write what they know in clear, not to say accurate, language; and yet these young people, as a class, represent our best secondary schools. Experience shows that it is not enough that expression be made an incidental aim in teaching knowledge. It must be made an essential end in every knowledge exercise. It will be shown later (Chap. XVII.) that there must also be separate, well-graded exercises for the training of expression, exercises in which facile expression is the chief purpose.

Power to apply Knowledge.

The school affords only limited opportunities for the practical application of knowledge, and yet in nearly every branch of study, if not in all, there are facts and principles that can be applied when learned, and such application makes clearer the pupil's knowledge of them. This is specially true in the school arts. Indeed, the knowledge taught in these arts is chiefly for guidance in practice.

3. The third end of teaching is *the training of skill*, the imparting of readiness and facility in doing with a special end. This is the chief aim in teaching the school arts, as reading, language, number, writing,

drawing, etc. The training of skill in these arts consumes more than half of the teacher's time in our elementary schools, and in the attainment of no other end is there such a sad waste of teaching effort. This is sometimes explained by the assumption that children have little interest in exercises that are designed to impart skill in doing; that knowledge is the basis of the child's interest. On the contrary, the desire for efficiency in action is one of the strongest impulses of childhood. All the child's powers, physical and psychical, are developed by activity, and the impulse to action is nature's means to secure needed growth. Indeed, every desire of the soul has as its correlate the meeting of some human want or need. The correlate of activity is efficiency or skill, and hence as a means to skill activity is made a pleasure and a delight. No activity affords a child keener interest or higher satisfaction than that which gives him *conscious skill.* In all art exercises skill should be the central, inspiring purpose.

Training of Skill.

Desire for Skill.

It is to be noted that skill, as herein used, is something more than mere facility in action. It is facility in realizing special ends or ideals. It is true that skill is a form of power, but it is power made ready and facile in action. Skill is, in a strict sense, a quality of the action and not of the power that acts. There are special advantages in treating skill as a distinct end of teaching.

Skill as an End.

CHAPTER III.

A TRINITY OF PRINCIPLES.

IT is herein assumed that teaching is an *art*, and as such has its fundamental principles which determine its methods. It is also assumed that a knowledge of these principles is essential to the highest success in teaching.

It is a happy fact that the guiding principles of the art of teaching are few in number. There are few teachers who can intelligently apply many principles in teaching, but there are many teachers who can successfully apply a few principles which they clearly understand. It is also fortunate that the guiding principles in teaching are simple, and can be clearly stated.

Guiding Principles Few and Simple.

It has been shown in the previous chapter that there are three comprehensive ends to be attained in the teaching process, to wit: *knowledge*, *power*, and *skill*. How can these ends be attained? How can knowledge be taught? How can power be developed? How can skill be trained or acquired? The answers to these three questions give us the three guiding principles of the teaching art.

I. KNOWLEDGE.

Since no primary idea can be defined, it is not possible to define the act called *knowing*. Suffice it to say

that to know an object is *to be certain that it is.* Certitude characterizes all acts of knowing, but not equally. There are different degrees of certainty in knowing. A high degree of certainty gives what has been called *real knowledge.* The degree of certainty that depends on the testimony or authority of other minds gives us *information.* Between so-called real knowledge and information are varying degrees of certitude. But for our present purpose it is not necessary to make a distinction between knowledge and information. The guiding principles in teaching apply equally to both, though they may be taught by different methods.

Degrees of Certitude.

Knowledge is the result of the act of knowing. The mind puts forth the act of knowing, and knowledge is the result or product. Hence the mind acquires knowledge *by its own activity*, not by the activity of another mind. Knowledge is possessed by no mind that does not put forth the act of knowing. In the absence of this knowing activity, the mind cannot acquire knowledge.

Result of Knowing.

It follows from these facts that knowledge cannot be transferred from one mind to another. Water can be poured from one vessel into another, but there is no "pouring-in" process in teaching knowledge. Knowledge can no more be transferred than feelings or purposes. All that is possible in teaching knowledge is to occasion the proper act of knowing. Even information cannot be transferred, and its so-called communication by language is possible only when the words used occasion the right mental activity. No error in teaching has occasioned more bad work than the assumption that knowledge

Knowledge not Transferable.

can be transferred from one mind to another, that mere telling is teaching. This has been the source of word cramming.

The psychical fact that underlies the teaching of knowledge is that the mind knows only by its own activity, and from this fact it follows that knowledge can be taught only *by occasioning the proper knowing activity*. There are two factors in teaching, the teacher and the pupil, and the essential factor is the pupil. It is what the pupil does, not what the teacher says, that determines the success of the teaching process. This explains the contrast often presented by teachers. One teacher presents lessons well so far as mere method goes, and yet fails as an instructor. Another teacher, who presents her lessons mechanically no better, succeeds admirably. The contrast is explained by the fact that the first teacher has a dormant class. She does her work, but the pupils do not do theirs, and hence her failure. The second teacher has the gift of awakening the interest of her pupils, of putting them mentally on tiptoe for the lesson, an art that has no recipe. All that she says or does occasions responsive activity in her pupils, and so she succeeds. These illustrations show why interest and resulting attention are essential conditions of all successful teaching, but they are only *conditions*. They cannot be made ends or exploited as principles of teaching.

Occasioning Knowing Activity.

The foregoing facts give us the first fundamental principle or law of teaching, to wit:

PRINCIPLE ONE. **Knowledge can be taught only by occasioning the proper activities of the learner's mind.**

This is the one guiding principle in teaching knowledge, a principle as certain in pedagogy as the law of gravity is in nature.

It follows from this principle that the method of teaching knowledge is determined primarily by the nature of the knowledge taught. The way in which the mind acquires knowledge must be observed in teaching it. Hence there can be no universal or even general method of teaching. There must be as many different methods as there are different kinds of knowledge to be taught. Perceptive knowledge can be taught only by observation; inductive knowledge by induction, etc.

Methods of teaching Knowledge.

It is specially to be noted that no primary idea can be taught by means of a word. A word may occasion the recall or reproduction of an idea that has been associated with it, but it cannot occasion the activity that results in a *new* idea, except it may be an idea of the word as such. A primary idea can be taught only by presenting to the mind an object that will occasion the appropriate activity. It follows that *all primary ideas in every branch of knowledge must be taught objectively*, that is, by presenting the appropriate objects to the learner's mind. The futile attempts to teach primary knowledge through words have been responsible for much failure in elementary instruction. It was once widely assumed that knowledge, even scientific knowledge, can be put in the minds of young children by means of words, and it is too evident that this old-time error still survives. Much of the so-called scientific instruction in physiology, and we may add geography, now forced upon young children, involves this radical error. Teachers

Primary Ideas taught Objectively.

are slow in learning that knowledge can be taught by language only when the words represent known ideas.[1]

Axiom of Teaching.

It is to be specially noted in this connection that the manner or method of teaching knowledge is determined, not only by the nature of the knowledge taught, but also by the psychical condition of the pupil. It is an axiom of teaching that *instruction both in matter and method must be adapted to the capability of the learner.* The adaptation of instruction to capability is an essential principle in all successful instruction. Not only does the mental power of pupils of the same age differ, but the capability of the same pupil varies from year to year. Nor is this variation, as previously shown (p. 17), due simply to changes in the energy and activity of the mind as a whole. There is a marked change in the *relative* energy and activity of the several mental powers at different ages — if preferred, a marked change in the mind's power to put forth its several activities at different ages.[2] As pupils advance in the course of study they pass through successive phases of mental development and activity, and, as a consequence, both the matter and method of instruction must correspondingly change from year to

[1] In a letter to Governor Marcy of New York, dated December 13, 1833, Hon. James Wadsworth says :

"If I am correct in my views, it is quite practicable *to pass into the minds of our youth* scientific knowledge, scientific facts, and scientific reasons for thousands of physical phenomena of constant occurrence through life. . . . I respectfully request you to call the attention of the legislature to the improvement of our common schools, and to a distinct expression of your opinion that scientific instruction may be introduced in our common schools *by means of lectures* adapted to the capacity of children — *the lectures to be read by the schoolmaster.*" [Italics ours.]

[2] White's "Elements of Pedagogy," p. 91.

year. Pupils in the higher grades can easily master subjects that cannot be successfully taught to primary pupils.

There are phases of knowledge in every branch that correspond to the phases of knowing. In its perceptive phase of activity the mind readily acquires perceptive knowledge, in its representative phase, representative knowledge, and in its scientific phase, scientific knowledge. Hence, *there is a natural order in which the powers of the mind should be exercised and the corresponding kinds of knowledge taught.*[1] The natural movement of the mind in the earlier processes of knowing is from sense perception through representative activity to reason, that is, *from sense activity to reason through the activity of the intermediate powers.*

Natural Order.

A true course of instruction for elementary schools cuts off a section of presentive, representative, and thought knowledge each year, but these successive annual sections do not contain the same kinds of higher or thought knowledge. There is a natural development of thought power and a corresponding order in thought knowledge. Scientific knowledge cannot be taught to infants, but it must wait until the pupil reaches the scientific phase of development. Nearly every branch of study has its phases of knowledge which correspond to the successive phases in the pupil's psychical growth. Geography, for example, has a primary-school phase (its primary ideas and facts), a grammar-school phase, a high-school phase, and even a university phase. It is idle to attempt to teach the astronomical explanation of the change of

True Course of Instruction.

[1] White's "Elements of Pedagogy," p. 104.

seasons to fourth year pupils. The subject belongs much higher in the course. Only the simple facts learned from observation and experience can be taught in primary grades. The young child is not a scientist or a philosopher, nor can he early master the causal reasons of physical phenomena.

Spiral Theory.

A true course of study has been compared to a spiral surrounding the several columns of human knowledge, and cutting off a section of each at every round of its ascent. This assumes that the several branches of knowledge rise from their simple elements by a natural sequence of subjects to their higher truths and applications, and that this sequence agrees with the expanding powers of the mind. It follows that in teaching any branch of knowledge the several subjects or topics should be successively reached in their true psychical order, that is, as the pupils gain the mental power to master them.

Abuse of Spiral Principle.

It is thus seen that the true spiral theory of instruction is *psychical*, not mechanical. It does not bring all subjects down to the lowest, and then keep pupils nibbling at them from year to year. This is a misconception and abuse of the spiral principle. There are, for example, subjects in arithmetic that should not be taught below the grammar grades. The several subjects included in algebra have likewise a proper sequence that should be observed in teaching the science. It is not meant that the higher subjects in a branch may not contain *elements* that can be taught earlier than the complete subjects. Nothing, however, is gained by the attempt to teach knowledge that is *above the capability or needs of the learner.* A merry-go-round is not a spiral.

2. Mental Power.

Every normal act of the mind leaves as an enduring result an increased power to act and a tendency to act again in like manner. Power and tendency are the resultants of all mental action. The power and tendency of the mind to observe are increased by observing; to imagine by imagining; to judge by judging; to reason by reasoning, etc.[1]

It follows from these facts that the power of the mind to put forth any kind of activity is developed *by occasioning such activity.* Perceptive power is developed by occasioning perceptive activity; thought power by occasioning thought activity; analytic power by analysis; synthetic power by synthesis, etc. Not only is it true that each of the mental powers is developed by occasioning its appropriate activity, but it can be developed in no other way. Activity is the only means of developing mental power.

Power developed by Activity.

From the foregoing psychical facts is derived the second fundamental principle of teaching, to wit:

Principle Two. **The several mental powers can be developed only by occasioning their appropriate activity.**

Here again it is seen that the teacher is but *the occasioner of right activity in the learner.* The essential factor in training mental power is the pupil's activity. The teacher can only occasion and direct such activity. The human soul is not a machine that can be put in motion by turning a crank. Its activity is the result of a self-exerted energy. The

Pupil's Activity Essential.

[1] White's "Elements of Pedagogy," p. 119.

function of teaching is to stimulate this energy. The school joins teaching and learning as correlates, the one the occasioner, and the other the efficient cause of knowledge and power.

The fundamental principle of training stated above applies to the development of all psychical power. The power of the soul in feeling, in willing, in all moral and spiritual activity, is developed only by activity in these directions. Right feelings are cultivated, the conscience quickened, and the moral judgment trained each by right activity.[1] This principle is the fundamental law of training the powers of the soul in all directions and under all normal conditions. It is a principle of universal application in teaching.

Principle Universal.

Attempts have been made to limit the application of this principle. It is claimed that the power of the mind developed by a given activity is not available in other activities; that there are as many kinds of mental discipline as there are different "spheres" of mental action, and that the mental power developed in a given sphere is available *only in that sphere.* This claim is set up in opposition to the so-called "dogma of formal discipline," a dogma which, in the extreme form in which it is often stated, is largely a product of the imagination. It certainly has a small acceptance as a theory of mental discipline.

Attempts to Limit.

Moreover, the question thus raised belongs to the course of study rather than to the art of teaching. So it must suffice here to say that the truth does not lie in either of these extreme views. On the contrary, all experience shows that while mental power developed by a special activity may not be available in

Truth Stated.

[1] White's "School Management," p. 224.

a totally different activity, it is available, though not, it may be, in equal degree, *in all related activities*, that is, in all spheres of activity that involve, though not exclusively, the action of the same mental powers. The analytic power developed by the solution of arithmetical problems is helpful in the analysis of sentences in grammar; the study of Latin shows itself in the easier mastery of natural science; the observation of plant life helps in the observation of animal life, etc.

Mental Habits.

It is not claimed, let it be noted, that mental power gained in one sphere of activity is *equally* available in all related activities. The power of observation acquired in the study of plants is not equally available in the observation of animal life, much less of chemical phenomena. The powers of the mind are most facile in the directions in which they have been exercised, especially in which *habits* of action have been formed. Indeed, long and absorbing observation of one kind of phenomena may result in a mental habit which may be a hindrance in the observation of other phenomena. But these facts do not show that the mental power developed by a given activity is *limited* to that special activity and is not available in other activities. Nor do they show that power developed by a given activity may not energize the mind as a whole, or, if preferred, may not energize the whole mental life.

Truth in neither Extreme.

The dogma of formal discipline is one extreme, and the doctrine that mental power is available only in the special activity that has developed it is another extreme. The truth lies in neither of these extremes. All experience shows that mental power developed in any sphere of activity is available, in greater or less degree, in all related activities.

There is, however, nothing in this principle that justifies the claim that, so far as mental training is concerned, it makes no difference what subjects are taught in school, provided they are well taught — a proviso which ignores the fact that some subjects cannot be well taught if certain other subjects have not been taught; that every course of instruction contains certain fundamental studies that must be mastered as a means of pursuing other studies. But the claim itself is based on an error. The several studies in a school course do not afford an equally valuable mental training, though all may afford training, and a helpful training. The elementary studies, for example, do not equally train the power of observation, even when taught by an "observational method," nor is an observational method equally applicable to all elementary studies. No one study affords equally effective training in all directions, and certainly all studies do not give equally valuable training in any one direction. There is no ground for the claim that all studies have equal educational value, either as discipline or as knowledge. A course of school training should clearly include at least the elements of knowledge in all the fundamental branches. This is necessary for the acquisition of higher knowledge, as well as for the harmonious development of the mental powers. All children who are not mentally defective are capable of receiving this necessary training.

Comparative Value of School Studies.

But let us come back from our long digression to the guiding principles of teaching under consideration. The question may be raised whether knowledge or the power to know should be made the leading aim in teaching knowledge. It is not easy to see how these two

results can be put in sharp contrast, since the power to know can be trained only by actual knowing, with both knowledge and increased power to know as results. There can be no effective training of the power to know that does not give clear and definite knowledge. Teachers whose pupils have vague and indefinite knowledge of the subjects taught have poor reason for pride in the training quality of their teaching. Such teachers are not successfully training their pupils' power to acquire knowledge, whatever may be true of their merits in other directions.

Knowledge or Power Leading Aim.

But this question has great practical significance when it relates to methods of teaching knowledge. Knowledge may be so taught and so acquired as to afford very little training of the power to know. This is specially true when information is taught by memoriter methods. It is possible for a pupil to know a statement and *not know the fact stated.* Not only is this possible, but is not an uncommon result when the attempt is made to teach knowledge to young pupils by words.

Moreover, there are still more practical reasons for the making of the training of power the leading aim in teaching knowledge. Mental power is not only more abiding than knowledge, but is of greater practical utility. While knowledge is a necessary guide in human effort, mental power gives acumen, grasp, strength, inspiration, and these are the winners of success in all the activities and conflicts of life. Even so-called practical knowledge, to be of real utility for guidance, must be thought out and applied by an intelligent mind. The superficial empiricist is liable to blunder in every new application of his knowledge.

Training Power Leading Aim.

I have elsewhere stated[1] that if my mind were a tablet and with a sponge I should erase every fact learned in school and college, and not applied at the time in some art, I should not be intellectually very poor, but were I to lose the mental power gained in the mastery of these facts, so many of which were long since happily forgotten, I should be poor indeed. The abiding practical result of my school and college training, such as it was, is *soul power*. This is believed to be the experience of all who have lived long enough to test fully the practical value of their school training.

Personal Experience.

It is thus seen that in education the act of acquiring knowledge is more important than the knowledge acquired. This vital truth is embodied in the following maxim of elementary instruction:

Maxim of Elementary Intuition.

Whatever knowledge is taught a child should be so taught that the act of acquiring it shall be of greater worth than the knowledge acquired.

In the face of the wide experience that attests this principle, there are those who ask of every school study, "Of what practical use will its facts be in the shop or in the store, on the farm or in the factory, in managing a railway or a bank?" They assert that the supreme and only test of the value of a school study is the practical utility of its facts for the purposes of guidance in life's business. If a fact cannot be used in the work of life, it is declared to be "a useless fact and its acquisition a positive waste of time and effort." This narrow utilitarianism is crowding our courses of study with facts, and is mak-

Narrow Utilitarianism.

[1] White's "Elements of Pedagogy," p. 123.

ing school instruction too largely a gradgrind process of cramming.

No intelligent person questions the value of practical knowledge or the importance of properly including such knowledge in school courses (p. 28), and certainly few modern educators hold that the practical worth of knowledge in life lessens its value as a means of mental discipline. The one result to be secured in teaching knowledge, *whatever may be its nature*, is the effective training of the power to acquire and express it. To this end it must be taught and acquired by methods that put the developing of power before knowledge.

Practical Value of Knowledge.

3. Skill.

As before seen, every act of the mind leaves as abiding results an increased power to act and a tendency to act again in like manner. This resulting power and tendency are increased by each repetition of an act. "All function," says Hoffding, "is made easier by repetition and practice." Where the tendency to repeat an act becomes so strong that the act "repeats itself" habit is formed, and action is involuntary or automatic. The increase of power and tendency by repetition is not necessarily equal, and it usually grows less and less as the limit of automatic action is approached. It is unnecessary to attempt here an explanation of these psychical facts. It is sufficient for our present purpose to know that both power and tendency in action are increased by repetition and practice.

Psychical Facts.

This principle of repetition applies to a series of acts as well as to a single act. At first each act in a series

requires attention, but at last the successive acts seem to flow automatically from the idea of the end. Thus a person may engage in conversation when sewing or even when playing a familiar piece of music. When we do anything from habit, the successive acts receive little attention, and most of these acts may be wholly automatic.

Series of Acts.

But automatic action is not skill in the sense in which the word is herein used. Skill is readiness and facility in attaining special ends. Aimless action, howsoever facile, is not skillful. Skill in doing is a higher phase of activity than mere motor action.

Automatic Action.

The first phase in the gaining of power and facility in action is the imitation of the action of another. At first this imitative movement is instinctive, as when a baby smiles in response to the smile of its mother, a sort of responsive coaction. The action of another, seen or heard, is a stimulus to motor impulse, and, by means of the activity thus occasioned, the child comes into the use of its active organs.

Imitation.

But instinctive and involuntary imitation soon passes into the voluntary reproduction of the action of another. The child *tries* to repeat what it sees and hears, the effort becoming increasingly conscious and pleasurable. By means of this conscious effort to imitate others, the child's activities are multiplied and varied, and its motor power and facility increased.

Voluntary Imitation.

From the imitation of what is seen or heard acting immediately as a motor stimulus, the child passes to the conscious reproduction of past actions, the memory of such actions serving as a motor idea and

Memory Imitation.

occasioning a motor impulse. The tendency to respond to such a stimulus is increased by repetition, and thus a past action may be repeated at the slightest motor impulse; and at last such repetition may become automatic.

The step is easy from the reproduction of past actions to the imitation or realization of those which are *imagined*, as in play. Play affords the child increasing pleasure in action, since he is becoming conscious of the power to originate as well as to imitate; that is, he is coming into conscious *self-activity*. This seems to be the real significance of play. **Imagination in Action.**

These several phases of imitation characterize the nursery and the kindergarten. The infant learns to walk, to talk, to sing, to play, to repeat nursery rhymes, etc., by imitative action; and all this activity plays an important part in the child's training and growth. "Man," said Aristotle, "is the most imitative of animals, and makes his first steps in learning by the aid of imitation." **Imitation in Infancy.**

The child at last rises from these lower phases of imitative action — the mechanical imitation of action seen or imagined — to the effort to realize in action a definite end, an idea of such end being the ideal that inspires and guides action. Thus, in singing the pupil tries to produce tones which his mind hears (tones in the mind), and in drawing he tries to make ideal forms or forms in the mind. This idea of the end, the *ideal*, puts the mind and the will into the voice and the fingers, and skill is the result. This is the art phase of imitation, *the skillful realizing of ideals*. **Realization of Ideals.**

It is thus seen that in learning any art, clear and inspiring ideals must guide practice; the clearer and

more inspiring the ideals, the greater the resulting skill. This is true not only in such manual arts as the pitching of a quoit, the shooting of an arrow, the drawing of a figure, etc., but also in the arts of reading, music, painting, sculpture, etc. In all art learning, ideals inspire effort and guide in movement and process; and, since the imagination is dependent upon observation and experience for the materials with which it forms its ideals, the wider the learner's observation of the work of skillful artists, and the greater his own experience and skill, the better will be his guiding ideals, and the more fruitful his practice.

Ideals in learning the Arts.

We thus reach the third fundamental principle of teaching, to wit:

PRINCIPLE THREE. **Skill in any school art is trained by practice under the inspiration and guidance of clear ideals.**

It follows from this principle that the essential step in teaching any school art is to lead the pupil *to form correct ideals of what is to be done or produced*, and to this end he should be presented with the best examples and models. In the lower primary grades, children must take their first steps in reading, language, singing, drawing, writing, etc., by imitation; but, as pupils pass up in the grades, they attain the power to act from ideals, and here true art training begins.

Forming Correct Ideals.

Skill in no art is acquired by simple practice. The Comenian maxim, "We learn to do by doing," is only a half-truth, even when applied to manual skill. We learn to do by doing *under the inspiration and guidance of true ideals.* Simple practice without such guidance never made an artist

Comenian Maxim a Half-truth.

or an artisan. Blind practice is always and everywhere a plodder. The poorest teaching, for example, is often done by teachers who have grown gray in the schoolroom. What is needed to transmute experience in teaching into power and skill is the inspiration of true ideals and the guidance of correct principles. The most skillful teaching the writer has seen in years has been by teachers with gray hairs.

No Art learned by Practice.

The arts of reading, writing, language, music, etc., are never properly taught by mere practice. Even the mastery of the two form arts, writing and drawing, requires something more than the mechanical imitation of model copies for a given number of minutes each day. The teacher's function is to lead the pupils to form clear and correct ideals, to teach them the best processes for attaining these ends, and then to secure necessary practice under the most inspiring guidance. Automatic practice may increase the mechanical facility with which pupils repeat known processes, but such practice never corrects errors or suggests improved methods. It begets the habit of non-attention to the conditions of right action, and creates mental habits which are subversive of skill. The mastery of any art involves *the acquisition of skill in realizing ideals.*

Knowledge of Processes.

A weakness in much art instruction is a failure to give pupils a *clear knowledge of the processes by which their ideals can be realized.* It is true that this knowledge may be slowly gained by tentative practice, but, since it is not an end but a *means* of practice, the earlier it is acquired, the sooner will the pupil master art processes. It is true that this guiding knowledge cannot be acquired much in advance of practice.

Practice not only applies, but indirectly interprets and makes clearer the knowledge that guides it. While the ideal guides the process as a means to the end, a knowledge of the process as such greatly facilitates the reaching of the end. The clearer the pupil's knowledge of both the end and the process, the more skillful will be his action.

This fact exposes the fallacy that underlies the attempt to teach knowledge by the *act* of embodying it in material forms. The child must have an idea of a cube or a sphere *before* he can make these forms, except by pattern. The same is true of the molding of the contours and reliefs of countries in sand. A knowledge of contour and relief must precede and guide the molding, if not done by pattern. It may be added that the production of forms by pattern has small educative value. Artisans who devote their time to the making of relief globes and maps by pattern acquire thus little real knowledge of geography.

Modeling and Molding.

The final step in art training is practice guided by principle or rule. The processes of every art are based on principles, and these, when formulated for guidance, are its *rules*. But these formal rules are of little, if any, value to the young learner, and hence they should not be introduced early. The old-time attempt to teach the art of language by means of the rules of technical grammar is an illustration of this error. This attempt was based on the false notion that skill in speech and writing is acquired through a knowledge of the rules of syntax, an error still too evident in American schools, especially in elementary schools whose pupils are too young to apprehend, much less to apply, formal rules in any art. In the later and

Rules.

higher practice of an art, a knowledge of its guiding principles is of great value, and these may finally take the place of the living teacher. The principles and rules of an art are most helpful in practice when they are so familiar to the artist as to be observed without being consciously in mind. It is only when ideals and rules become unconscious guides that true art appears.

CHAPTER IV.

A TRINITY OF PROCESSES.

WE have now considered the three fundamental ends to be attained in teaching, and the three guiding principles or laws to be observed in their attainment, and are thus prepared to consider the *teaching processes* that embody these principles.

While there is a great variety of activities involved in teaching, these are all included in three fundamental processes, each capable of clear description and separate study. These teaching processes are known as *instruction*, *drilling*, and *testing*. Every teaching exercise is one of these processes, or a combination of two or all of them.

Three Teaching Processes.

The process called instruction may be defined as the *occasioning of those mental activities in the pupil that result in knowledge and an increased power to know*. Instruction is the occasion, the pupil's mental activity is the cause, and knowledge and knowing power are the results. It is thus seen that instruction has for its end not only the teaching of knowledge, but the training of the power to acquire knowledge. In some instruction exercises knowledge is the chief conscious end, while in other exercises training is prominent; but in all cases the teaching of knowledge characterizes the process of instruction. Moreover, instruction may be the only process in a teaching exer-

Instruction.

cise, or it may be only preparatory to drill or practice, as in teaching the school arts, or it may alternate with either of the other processes. It will be increasingly clear that instruction is a fundamental and most important teaching process.

The drill as a teaching process has for its chief end *the training of power and skill*, especially skill in the several school arts. The drill is also used to make clearer and hence more permanent the results of instruction and study. It is not enough that pupils be once led to know facts or even to reach a truth by inductive steps under a teacher's guidance. They must also acquire the power to reach it again with less guidance and greater certainty. These results are secured by repetition or practice. In elementary schools the drill absorbs full three fifths of teaching time and effort; and hence a knowledge of its function, methods, and limitations is of very great importance.

The Drill.

The test has for its end *the disclosing of the results of instruction, drill, and study*, the disclosing of the pupil's attainments. The test is the eye of teaching; the guide and inspirer of teacher and pupil. It not only throws needed light upon the teacher's work, but also awakens interest, secures attention, and adds energy and persistence to the pupil's efforts. The test accompanies and supports both instruction and drill.

The Test.

The propriety of considering the test a teaching process has been questioned, but the objection has its source in the misconception that teaching and instruction are synonymous terms. It is true that teaching includes instruction as one of its processes, but all teaching is not instruction. Teaching

Testing a Teaching Process.

is the occasioning of those activities in the learner that result in knowledge, power, and skill (p. 9), and hence it clearly includes testing. The test adds efficiency to both instruction and drilling, and so shares the results of each process. There is no successful instruction without a knowledge of the results attained, and the more clearly these results are known by the teacher, the more intelligent will be his efforts and the higher his skill and success. Instruction is not firing knowledge at pupils in the dark. The teacher must know what his pupils know to determine what they can best learn next.

Blending of Teaching Processes.

It is not meant that the teaching processes described above are usually separate in teaching. On the contrary, they often succeed each other in the same exercise, and as often, it may be, blend and support each other. But in most teaching exercises one of these processes is the leading and central process, the others being subordinate, often incidental. It is important for the teacher to know in advance whether instruction or drilling or testing is to be the leading purpose of an exercise. The skillful teacher knows what he is doing. His efforts are guided by a clear and definite aim.

Teaching Exercises.

The three teaching processes give, when used separately, three distinct teaching exercises, to wit: *instruction* exercises, *drill* exercises, and *test* exercises. But in practice, as already noted, these teaching processes are more or less united, this being specially true of instruction and drilling, as in teaching the school arts

(p. 50). Also in teaching knowledge repetition may be necessary to deepen impression or to add clearness to the pupil's apprehension of what is taught. Indeed, the union of instruction and drilling in teaching is so common that neither term is ever technically used to designate the exercise. On the contrary, such an exercise is called a *Lesson*, the term lesson being used indiscriminately to denote an instruction exercise or a drill exercise or an exercise combining instruction and drilling. Thus, we speak of a lesson in history, a lesson in hygiene, a lesson in reading, a lesson in drawing, etc.[1]

The Lesson.

The testing process is, as will be more fully shown later (p. 90), a necessary element in every instruction or drill exercise, but its place is subordinate and incidental. When testing is the *chief* purpose of an exercise, it is a test exercise, and is properly called a *Recitation*. The term recitation is composed of the Latin *re*, again, and *citare*, to tell or say; and the use of the term to denote a test exercise doubtless had its origin in the old practice of requiring pupils to repeat or recite the words of the book as evidence of their knowledge. Whatever may be true as to its original use, there is no better term to designate this vital exercise in school training.

The Recitation.

It is thus seen that in practice teaching exercises divide into two distinct classes, designated by the terms *lessons* and *recitations*, the former including instruction and drilling (testing being incidental), and the latter test-

[1] The term *lesson* is also applied to the subject or object taught or assigned for study; also to what may be assigned to be done. But this use of the term occasions no difficulty, since the context clearly indicates the sense in which the word is used.

ing, more commonly the oral test. There is great practical advantage in using the terms lesson and recitation with this sharp distinction in meaning. The use of terms in a vague and indefinite sense is the source of serious confusion in pedagogy. All activities and processes that differ essentially ought to be designated by different terms, each used uniformly with a definite meaning.

Proper Use of These Terms.

The term lesson is now generally used in the sense here indicated. It is common to apply the term to instruction exercises, and it is even more common to apply it to exercises which include both instruction and drill, as in the school arts. But the term *recitation* is unhappily used in a more indefinite sense, it being often used, especially by students of German methods, to denote *any* teaching exercise. Nothing is gained in theory or in practice by the use of the term recitation in this blanket sense. We have teaching exercises which are definitely known as *lessons*, and there are other teaching exercises which are not lessons. What is greatly needed, both for clearness and definiteness, is a term to designate these non-lesson exercises. The needed term is *recitation*, a word that both historically and properly designates the vital test exercise.

Too wide Use of the Term Recitation.

It is very important that the terms lesson and recitation be used in pedagogy in the definite senses here indicated. Such use will emphasize the distinction between these two classes of exercises, and, at the same time, will widen the recognition of the test exercise as a most vital element in school training. It is only a few years since nearly all the teaching exercises in American schools, above the lowest primary, were recitations, the lesson having a

Use of Terms in Pedagogy.

small place, especially the oral lesson for instruction. Now in many schools the class exercises are nearly all lessons, the recitation receiving little attention. No change in teaching in the last twenty-five years has been more marked than this. The recitation with its eye-to-eye search has been widely superseded by the written test; and teaching has become the giving of lessons, too largely talking.

This marked change in teaching has been attended with both gains and losses, and certainly the losses are too serious to be ignored (p. 118). Pupils are coming to the high school with little power and less habit of study, and their dependence upon the teacher "to make all things clear" is increasing. In too many instances teaching has become a process of preparing pupils for written examinations. What is needed is not less fruitful instruction, but more of the vitalizing oral search. To secure this, it is important that the lesson and the recitation be conjoined as *complementary means of school training;* and, to this end, they must be properly correlated, a word that clearly expresses the kind of union needed. The manner in which this can be done effectively will be made clear in subsequent pages.

Change in Teaching.

It is to be noted here that the terms lesson and recitation are applied in this treatise only to *teaching* exercises; that is, exercises whose guiding ends are knowledge, power, and skill (p. 26). There may be exercises in schools, especially in primary schools, whose aim may be physical activity, relief, recreation, even amusement. There is an evident impropriety in calling such exercises lessons, and much greater impropriety in calling them recitations. They are not teaching exercises.

CHAPTER V.

METHODS OF INSTRUCTION.

IT has been assumed as an axiom of teaching that instruction must be adapted to the capability of the learner (p. 36). This adaptation relates to the knowledge taught and also to the method of teaching it. Knowledge which can be readily taught an adult may be beyond the capability of the infant. The infant is in the perceptive phase of mental development. His dominant mental activity is the acquisition of primary knowledge, and his generalizations are chiefly acts of judgment, and are reached by short and easy steps. The child has, moreover, a comparatively small stock of ideas and facts for use as materials for thought. The adult, on the contrary, is in the reflective or scientific phase of mental activity. He has acquired a large stock of both primary and general knowledge, and he has also gained considerable power and facility in the higher thought processes. It is possible not only to teach the adult knowledge that is beyond the ability of the infant, but also to teach him in a different way.

The Infant and Adult.

Between these two periods of mental development and acquisition, there are transitional phases in the capability of pupils, and corresponding changes in the kinds of knowledge that can be successfully taught. At every step in the school course there must be the intelligent adaptation of instruction in matter

Transitional Phases.

and method to the changing ability of pupils. This makes instruction an art, and not a mechanical routine.

As already stated (p. 35), the manner in which the mind acquires knowledge necessarily determines the method of teaching it, and this is true at every stage of the mind's development. It follows that there must be as many methods of instruction as there are different kinds of knowledge to be taught. Perceptive knowledge is acquired by perception, representative knowledge through memory and imagination, and thought knowledge by thinking, including generalization, judging, and reasoning. Since these different kinds of knowledge are acquired in different ways, they cannot be taught in one way or by the same method.

What determines Method.

These psychical facts afford an intelligent basis for a helpful classification of methods of instruction, the term *method* being herein used in the sense of an orderly and rational procedure to attain definite results or ends. An elementary course of instruction contains (1) primary ideas and facts, acquired largely by observation; (2) higher knowledge, acquired by thought; and (3) recorded or spoken knowledge, acquired from its expression in language. These three kinds of knowledge acquired in different ways give three distinct methods of instruction. These methods are known as the *Objective* method, the *Indirect* or *Socratic* method, and the *Direct* or *Telling* method; and each may be studied in a thorough and practical manner.

Classes of Methods.

1. The Objective Method.

All primary ideas are occasioned in the mind by the presence of appropriate objects, material or immaterial.

Thus, the primary ideas of form, color, sound, relations, etc., are produced by the reaction of the mind on appropriate objects. All material objects are presented to the mind through some sense. The object, thus presented, occasions an excitation of the sense, producing a *sensation* (feeling), and through the sensation the mind, in an inexplicable way, perceives or knows the object. The result is an *idea*[1] of the object.

Primary Ideas.

A primary idea cannot be taught except by presenting to the mind the object that will occasion the necessary activity. It cannot be taught by means of a word, for the reason that a word cannot occasion the proper activity of the mind. A word may occasion the reproduction of a known idea associated with it, but a word cannot occasion the activity that results in a *new* idea. It can only occasion an idea of *itself* as a sound or as a form. An idea of color, blue for example, can be taught only by presenting the color to the mind through the eye, and an idea of sound can be taught only by presenting the occasioning object to the mind through the ear. It is for this reason that children who are born blind cannot be taught color,[2] and those who are born deaf cannot be taught sound.

Primary Ideas not taught by Words.

[1] The term *idea* is here used in the sense of percept or sense concept, as the result may be.

[2] It has been claimed that the blind learn to recognize color, but this is true only in the sense that they learn to recognize, to some extent, colored objects, as flannels of different colors. This is done by the sense of touch through which the mind perceives the associated *temperature*, not color. Black flannel, for example, feels "black-warm"; red flannel, "red-warm"; white flannel, "white-cold"; blue flannel, "blue-cold," etc. What the mind perceives is the characteristic associated temperature.

This principle applies also to the teaching of facts that involve new primary ideas. Such facts can be taught only by first occasioning the new ideas. The fact that honey is sweet cannot be taught to a mind that has not the idea denoted by "honey" and "sweet." The relations between ideas cannot be known if the ideas are not known.

It follows from the principles reached above that all primary ideas and facts in every branch of knowledge must be taught by presenting the appropriate objects to the learner's mind. This is known as the *objective method* of instruction. It is characterized by the study of things and phenomena as a means of knowing these objects. The objective method of instruction may be defined *as the presenting of objects to the mind in such manner as to occasion those activities that result in a knowledge of the objects presented.* It includes the exciting of curiosity, the awakening of interest, the directing of observation, the fixing of attention, and all other means that assist the pupil in knowing the object. The study of an object by observation includes not only perception, but comparison, judging, and other thought processes.

Primary Ideas taught Objectively.

Objective Method Defined.

The objective method is used increasingly in all grades of schools from the kindergarten to the university. It is used in teaching the first ideas of number, including simple number relations and processes; the primary facts of geography; nature lessons; the natural and physical sciences; and all other branches that contain objective knowledge. In secondary schools and higher institutions it is often called the "Laboratory Method." It is also used as

Its wide Use.

an initial step in the process of teaching thought knowledge, this being specially true in teaching the inductive sciences. No change in instruction in science has been happier than the early study of things in place of the study of what books say about things.[1]

The objective method is often used improperly by teachers who do not clearly understand its true function.

Abuse of Objective Method.

This error occurs in teaching number when objects are used after they have served their purpose, and especially when the measurement of concrete magnitudes is made the continued means of teaching number relations and processes. It always appears when a method is made an *end* in teaching and is manipulated as such.[2] This folly reaches its climax when an initial step in a teaching process is exploited as a *method* of teaching the subject. In no other work is the pedantry of the method grinder more obvious than in primary instruction.

2. Indirect or Socratic Method.

Thinking first appears in the forming of general concepts. When the mind has concepts of several individual things in a class, it passes by a process called generalization to the general concept that represents the class. Thus from concepts of several individual oranges, it passes to the general concept expressed by the word *orange*.

General Concepts.

[1] When the writer was in college, he studied mineralogy from a text-book, without seeing the minerals, much less handling them. He afterward found that his real knowledge of minerals was largely limited to those which he had seen and handled in his boyhood in the country.

[2] The author's attention was recently called to an official circular letter addressed to teachers in which were the questions: "Do you teach the Synthetic method?" "Do you teach the Grube method?"

Another step in thinking is the comparing of known things and discerning their common qualities or likeness. A common quality may be thought of in connection with the objects compared, as "yellow oranges," or it may be formally thought or affirmed, as, "These oranges are yellow." These forms of thinking are called judging, the first, "yellow oranges," simple judging, and the second, "These oranges are yellow," formal judging, the resulting thought being called a *judgment.*

Judging.

A true judgment is a *fact*, and hence by thinking the mind passes from individual concepts to general concepts, and then to facts, — to particular facts, as, "This tree has roots"; to general facts, as, "Trees have roots." The general facts reached by judging are limited to observation and experience. They are not universal facts. The judgment, "Trees have roots" is at first limited to known trees, though stated as if it were universal.

Facts of Judgment.

But the mind is endowed with the power to pass from facts of judgment, whether particular or general, to *universal truths.* Thus, the mind may pass from "This elephant has a trunk" to "Elephants have trunks" (meaning known elephants), and from these to "All elephants have trunks." The first two of these facts are facts of judgment, and are limited to experience; the last is a universal fact, and is reached by a thinking process called *reasoning.* The mind sees in the particular facts a cause, or *reason*, for the general inference. When this discerned reason is a necessity of nature or thought, the general truth is certain knowledge. This process of passing from particulars to generals is called inductive reasoning or, more simply, *induction.*

Universal Truths by Induction.

The mind has also the power to discern in a general truth the validity of all included facts, thus descending from a knowledge of universal truths to a cognition of particular facts. Thus, from the general, "All magnets attract iron," it infers that a magnet will attract a particular iron nail. This mode of thinking is called deductive reasoning or, simply, *deduction.*

Deduction.

It is thus made evident that only a small part of human knowledge is acquired by simple observation. It is an innate impulse of the mind to pass from the facts of observation and judgment to the universal truths of reason. It is true that in observation thought plays an important part, so that the mind knows more than the senses disclose, but the eye of reason sees truth that lies far beyond the ken of sense. The senses see only the present phenomena of nature, but thought interprets observed phenomena and discerns nature's marvelous truths, forces, and laws.

Mind's Impulse.

These psychical facts make it possible to teach thought knowledge by beginning with known facts, and leading the pupil *by thinking* to know the general and the universal. The pupil may be led to recall objects previously known, and then by thought to discern their likeness or difference, their relations as parts and wholes, as means and ends, as causes and effects, etc. In all this the teacher is only the occasioner of the pupil's thinking. He does not tell the pupil what he wishes him to know, but leads him to discover and know it for himself.

Indirect Method.

This method of instruction is known as the *indirect* or *training* method. Its nature is clearly indicated by the maxim, *Never tell a pupil anything which you can lead him to know and tell you.*

Training Maxim.

It is also called the *Socratic* method, having been the characteristic method of Socrates, the great Greek teacher, and the most famous teacher of antiquity. He began with what his pupil knew, and then skillfully led him to know even the profound truths of philosophy.

Socratic Method.

The two methods of instruction now considered, the objective and the indirect, are embodied in several well-known maxims, reached from time to time by the great reformers in education, and specially developed by Pestalozzi. Seven of these maxims may be stated as follows:

Primary Maxims.

1. *Observation before reasoning.*
2. *The concrete before the abstract, or sense knowledge before thought knowledge.*
3. *Facts before definitions or principles.*
4. *Processes before rules.*
5. *From the particular to the general.*
6. *From the simple to the complex.*
7. *From the known to the related unknown.*

These several maxims specially relate to elementary instruction, and they are not presented as universal principles of teaching. For example, the maxim, "Processes before rules," is an important principle in teaching arithmetic, and also elementary algebra, both branches being best taught inductively,[1]

Not Universal Principles.

[1] If the maxim, "Processes before rules," be accepted as a sound principle in teaching arithmetic and algebra, then the rules should *follow*, and not precede, the problems in text-books. One of the sanest statements in the report of the "Committee of Ten" is that in arithmetic all principles and rules should be derived inductively, and that the rules should come "*at the end*, rather than at the beginning of the subject." The same is true in elementary algebra, since in most cases the rules can be derived from the processes.

but no wise teacher would accept it as a guiding principle in teaching higher mathematics. The maxim does not apply to such conventional rules in arithmetic as partial payments, annual interest, etc., — rules which are not reached inductively, but are a statement of what is law or custom.

A like limitation applies to the maxim, "From the particular to the general." In higher instruction the true order may be from the general to the particular, this being always true in deductive processes. It is, however, to be noted that this inverse order is possible only when the mind is in possession of those primary ideas and facts which are necessary to the apprehension of the abstract and general. The maxim is a true principle in the teaching of the *elements* of all branches of knowledge, and also in teaching all inductive knowledge.

Limitation in Higher Instruction.

These several maxims all involve the principle that there is a *natural order* in which the mind acquires knowledge, an order that should be intelligently observed in elementary instruction and training. These maxims do not, however, imply that there should be long or even distinct intervals between observation and reasoning, or between any primary or lower activity and the related higher. The mind by its own impulse and activity passes from observation to thought, from the concrete to the abstract, from the known to the related unknown, etc., and it is not possible to separate these related activities in a course of study. Their true sequence is best observed by the living teacher in the details of instruction.

Natural Order.

It is ever to be kept in mind that the child observes as a child, thinks as a child, and reasons as a child in

his psychical condition. It is a serious mistake to attempt to force the young mind to do what it has not the ability to do successfully. Scientific knowledge must wait until pupils have come to the period of scientific thought. The primary pupil acquires even elementary knowledge slowly. There is, however, danger of falling into the opposite error, and keeping the pupil in a lower activity when he has the impulse and the ability for a higher activity. This error is common in objective instruction, children being kept swinging on the gate of sense when they are prepared to make easy and fruitful excursions into the garden of thought.

Child Limitations.

3. The Direct or Telling Method.

The direct method of instruction is the occasioning of the proper activity of the learner's mind *by means of language, oral or written.* It is the making of knowledge *common* to teacher and pupil by its expression, called the communication of knowledge. The possibility of occasioning knowledge in another mind by means of words is a matter of common experience, and on the certainty of the knowledge thus acquired are based human action and conduct of the highest interest and importance. It is this function of language that makes speech one of man's best endowments.

Communication of Knowledge.

While knowledge cannot be transferred from one mind to another, it may be communicated by means of language if the words used occasion the proper knowing activity. A knowledge of new facts may be occasioned by presenting to the mind known objects in *new* relations, and this may be done by means of language.

Condition of Communication.

It has been urged that though the mind may clearly apprehend a relation expressed by words, it does not know that the relation thus expressed is real or true; that this is accepted on the testimony of another mind, and hence the result is *information*, not knowledge. This is doubtless true of much knowledge communicated by means of language. There is an element of faith in its acceptance as real, but this is not true of all communicated knowledge. On the contrary, many facts thus presented to the mind are known to be true as soon as they are apprehended. Their reality is known by an intuitive or thought process, and the result is knowledge. For example, the statement, "The source of a stream is higher than its mouth," is seen to be true when clearly apprehended, provided the mind has the necessary knowledge of running water. The same is true of the statement, "A piece of lead is heavier than an equal volume of iron." This fact may be clearly apprehended by the mind that has a clear concept or idea for each word in the statement, and its trueness is seen if the mind has the necessary knowledge of lead and iron.

Objection Answered.

It is thus seen that the teaching of knowledge by means of language depends primarily on the use of words that express to the learner known concepts and ideas. The sentence, "The parrot is in the cage," expresses a fact only to the mind that knows the meaning of "parrot," "cage," and "in." The clearer the meaning of these words to the learner, the clearer will be his knowledge of the fact expressed. This shows that great care and skill are required to teach knowledge by means of language. Objective and concrete instruction must often prepare

Conditions to be Observed.

the way for the use of the direct method; and this is specially true, as will be shown later, when knowledge is to be gained from the printed page. The fact has been noted (p. 43) that a pupil may know the statement of a truth without knowing the truth stated.

But language is at best an imperfect means of expressing human thought, and this is specially true in the instruction of the young. Most words are materialistic in their origin, and hence they best express the ideas and facts of nature and common life. But even here the teacher is often obliged to supplement language by illustration, as by diagrams, maps, sketches, pictures, models, stereopticon views, etc. In direct instruction the abstract is often made plain by the concrete, the general by the particular, the complex by the simple, the unknown by the related known, etc. The deeper truths of ethics and religion may by illustration be brought within the comprehension of the learner. This is the significance of the parable, the fable, the allegory, etc. The little girl's notion of a parable as "an earthly story with a heavenly meaning" is not a bad definition. Indeed, so necessary is the use of illustrations in direct teaching that it may be regarded as an important feature, if not a part of the method. In presenting the occasions of knowledge to the young learner's mind, language must often be thus supplemented, for words are at best imperfect signs of ideas.

Illustrations.

It may properly be noted here that the illustrative method of teaching is not the same as the objective. In objective instruction the fact taught relates to the object presented; is, in a sense, in the object. On the contrary, an illustration throws light upon a fact or truth that lies outside

Illustrative Instruction not Objective.

of itself. Our Lord used the illustrative method in teaching spiritual truth. He did not give object lessons. The truth taught was not in the parable, certainly with few exceptions, if any.

It may here be added more explicitly that the direct illustrative method of instruction is in harmony with the psychical fact that knowledge is possessed only by the mind that puts forth the act of knowing (p. 33). It is also in full agreement with the principle that knowledge can be taught only by occasioning the appropriate activities of the learner's mind. The end sought by the method, as well as by the objective and indirect methods, is *the occasioning of the proper act of knowing*. It is neither a talking nor a cramming process. It is a true method of instruction, though easily abused.

Direct Illustrative Method.

It seems unnecessary to note that school courses of study contain much knowledge that can be taught only by the direct or telling method. This is true of biography, history, civics, hygiene, and other branches, and all *names* must be taught directly. The art of reading is primarily the getting of knowledge from printed or written language; and book study is the pupil's persistent effort "to pick thought out of its verbal husk," as President Woolsey, of Yale, once put it. It is one of the chief functions of the school to train the pupil's power to acquire knowledge from books, to master the printed page.

The three fundamental methods of instruction, now considered, are sometimes united in the same exercise. In a simple lesson on an object, pupils may be led not only to observe accurately, but also by thinking to know more than the senses disclose;

Union of Methods.

and the telling of some fact or incident may excite curiosity, deepen interest, and sustain needed attention. The present object may be only a stimulus to the mind in thought activities, and this is often true in all grades of instruction.

CHAPTER VI.

OTHER METHODS OF INSTRUCTION.

THERE are other methods of instruction that receive more or less attention in works on pedagogy. Two of these related methods are called the *Analytic* and the *Synthetic.*

ANALYTIC AND SYNTHETIC.

In the analytic method, knowledge is taught by beginning with a whole and proceeding by an analytic process to its elements or constituent parts. In the synthetic method knowledge is taught by beginning with the elements or constituent parts and proceeding by synthesis to the whole. Thus, a word is taught analytically when it is first presented as a whole, a sound or a form, and then by analysis its elements, sounds or letters. A word is taught synthetically by beginning with its elementary sounds or its letters and then forming the word by a synthesis of these elements.

Analytic and Synthetic Methods.

But, as Sir William Hamilton has shown, analysis and synthesis are necessary correlates. If either is included in a complete process of knowing, the other is also present. Thus, the analysis of a word into its elements is attended with a synthesis of these elements into the word. The mind passes from the whole to the parts, and then from the parts back to a more definite whole. The same is true

Analysis and Synthesis Correlates.

when the initial process is synthetic. The mind passes from the synthesized whole back to its constituent parts, and thus a vague whole may be made more definite.

It is thus seen that there is no complete separation of analysis and synthesis in methods of instruction. The method called analytic includes synthesis, and the method called synthetic includes analysis. It is the initial process that gives name to the method. When instruction begins with analysis, it is called analytic, and when it begins with synthesis, it is called synthetic.

It has been claimed that all subjects are best taught by the analytic method, that is, by beginning with the whole. This may be true in teaching objects that can be presented to the mind as a whole, as a plant, an animal, a picture, a machine, etc., but all subjects cannot be thus presented. Biography and history cannot thus be taught, since at first the pupil has no *known* whole to analyze. He reaches the whole by a progressive synthesis of elements *as they are known.* A knowledge of the history of a country, for example, is necessarily reached by synthesis, the whole being too vague for analysis. Even the child's little world of home is the product of many acts of synthesis. In short, if the whole cannot be presented to the pupil's mind, instruction must begin with what can be presented, the parts, and the whole then reached by synthesis. It is not meant that the elements are at first known as constituent parts, for this would involve a prior knowledge of the whole. They may first be known as individual facts.

Analytic Method not General.

In actual practice these two processes are usually united. This is true even in teaching the arts in which the pupil's activity is chiefly synthetic. In teaching pen-

manship, the letters of the alphabet may be analyzed into their elements or principles, and by practice the pupils may learn to form these elements, and then to combine them into letters, the letters into words, the words into sentences, etc. As a preparation for this synthetic practice, the pupils may be taught the analysis of each letter, and the manner in which letters are united in forming words; but the fact remains that writing is a synthetic process, and skill is acquired only by synthetic practice.

Their Union.

It is true that the teacher's preparation may properly include an analysis of the subject to be taught, and the results of this analysis may guide him in teaching it. But in order to make such an analysis, the teacher must have a *knowledge of the subject*, the very result to be attained by the pupil through instruction. It is also true that some of the elements of a subject may be taught analytically even when the whole is reached by synthesis.

Teacher's Preparation.

There does not seem to be sufficient ground for an attempt to base general methods of instruction on these correlative activities. The descriptive terms, analytic and synthetic, are more properly applied to *processes*, as in the expressions chemical analysis, botanical analysis, grammatical analysis, phonic analysis, phonic synthesis, synthetic division, synthetic exercises in language, synthetic construction, etc. All art processes are synthetic.

Applied to Processes.

Inductive and Deductive.

Two other related mental processes, *induction* and *deduction*, have been made the basis of methods of instruction. As already shown (p. 63), a thought pro-

cess is inductive when it begins with particular facts and by an inference reaches a general truth or principle; and a thought process is deductive when it begins with a general truth or principle and by reasoning deduces included truths or facts. But it is not possible to make these two processes the basis of general methods of instruction. All general facts and truths are not reached by induction, and most particular facts cannot be known by deduction. Only inductive knowledge can be taught inductively and only deductive knowledge can be reached deductively. It is thus seen that the inductive and deductive methods of teaching are each limited in application, and hence are not general methods.

Induction and Deduction.

It is further to be noted that while inductive instruction is synthetic and deductive instruction is, in a sense, analytic,[1] only a comparatively small part of synthetic teaching is inductive and, perhaps, a smaller part of analytic teaching is deductive. The constituent parts of a sentence or a landscape can be taught analytically, but not by deduction; and the facts of biography and history may be grouped by synthesis, but rarely by induction. The inductive method is limited to the teaching of *inductive knowledge*, and hence may properly be used in teaching subjects in arithmetic, algebra, physics, and other inductive sciences. The deductive method has a comparatively small

Limits of Induction and Deduction.

[1] Several writers on pedagogy treat the inductive method as analytic, and the deductive method as synthetic. It is not evident on what ground the passing by inference from particulars to a general is called analysis, or the passing by reasoning from a general to its included particulars is called synthesis. The reverse is true. The inductive process is synthetic and the deductive process is analytic, certainly so far as analysis and synthesis are present in these processes.

place in elementary instruction. It is very important that teachers see clearly the use and limitations of inductive and deductive instruction.

There is perhaps no method of teaching more frequently misused than the inductive. Pupils are led to generalize facts without seeing the *reason* for the inference. Different kinds of paper are burned, and pupils are permitted to infer, "All paper will burn." They may learn afterward that asbestos paper will not burn. They are shown that heat expands an iron ring, a brass ring, a copper ring, the glass stopper to a bottle, etc., and they jump to the conclusion, "Heat expands all solids." They may soon learn that heat does not expand wood, brick, tile, ice, and several other solids. Attention is called to the color of sheep, and all the sheep seen by the pupils are white, and they are permitted to infer, "All sheep are white." These are given as specimens of the bad work done in the name of induction. The inference is too often "a leap in the dark." A teacher who uses the inductive method ought to know that all generalizations are not made by induction.[1]

Misuse of Inductive Method.

Many general facts are reached by simple comparison and judging, and are *limited* to one's observation and experience. They are not universal truths, and should not be stated in the form of universals.

Concentration and Correlation.

In the past few years very earnest efforts have been made to secure the adoption of what is indiscriminately

[1] For the true nature of induction, see White's "Elements of Pedagogy," pp. 70–75.

called the "Concentration" and the "Correlation" method of teaching, the characteristic feature of the method being the grouping of several studies around one study as a "central core." So far, the advocates of this method have not been able to agree as to the number of such cores in a course of study, opinion varying from Ziller's single core to De Garmo's three cores. The advocates of Ziller's single core are not agreed, though few in number, on the branch that should be made this core.

Concentration and Correlation.

In another place[1] we have attempted to indicate the extent to which this principle of unification (concentration?) can be applied in an elementary course of instruction. It is there assumed that the studies in a school course naturally fall into coördinate groups or unities, each group having its own principle of development and law of sequence. There are, in the opinion of Dr. W. T. Harris,[2] at least five such coördinate groups of elementary studies, and including industrial and manual art, there are six groups in the upper grades. No one of these six coördinate groups can be unified with another coördinate group except by making one *subordinate* to the other, both in development and sequence. But it is clear that coördinate groups of studies cannot be unified on the principle of subordination, and so, theoretically at least, the unification of the studies of the school course turns on the existence of two or more coördinate groups in such course. *Coördination of studies excludes subordination.*

Coördinate Groups of Studies.

[1] "Isolation and Unification as Bases of Courses of Study," Proceedings of National Educational Association, 1896, pp. 316–323.

[2] "The Necessity for Five Coördinate Groups of Studies," — Dr. W. T. Harris, Proceedings of N. E. A., 1896, pp. 287–296.

In determining the extent to which the principle of unification can be applied, it is important to see the distinction between the unifying of allied subjects in the *same group* and the unifying of subjects that belong in *different* coördinate groups, and, with still more marked contrast, the unification of coördinate groups. There is often a close and obvious relation between subjects in the same natural group, and their union at different points may be both feasible and desirable. Take, for example, the several subjects included in the mathematical group. Whether arithmetic, algebra, and geometry shall be taught tandem or the elements of algebra and concrete geometry be run abreast of arithmetic in the latter part of the grammar-school course is a pedagogical question that can be settled by trial, provided that in the trial there is a *real* unification, and not simply a mechanical mixing or sandwiching of the subjects. This is simply the correlation of allied subjects *within a group*, but the hitching of mathematics to history or to natural science is another matter.

Correlation within Coördinate Groups.

It is conceded that facts and even a group of facts in one coördinate branch may be used in a lesson in another branch, especially for purposes of illustration or for disclosing mutual relations. A teacher may, for example, use the transparency of glass to illustrate the meaning of a lucid style in speech or writing, but it is evident that this is not a correlation, much less a unification of physics and rhetoric *as branches*. The same is true when skill in one branch is used as an aid in teaching another, as when skill in drawing is utilized in teaching geography. There may be great advantage in grouping closely

Facts in Different Coördinate Groups.

related facts in different branches, as in history and geography. But these feasible "cross references" in instruction should not be magnified as the unification of the branches. They are incidental, not vital features of instruction, and in no true sense correlate the studies. It may be added that these interrelations of different branches are most common in their elements, but as the course advances coördinate studies become more and more separate, each increasingly having its own development, and, as a consequence, its own sequence.

It is further evident that the unification of different subjects falls largely *within the details of actual instruction* and is the work of the living teacher. True correlation, not to say unification, is something more than a mechanical mixing of subjects, and is practicable only when subjects have close interrelations. The union, for example, of nature lessons and literature may give now and then a beautiful, even striking, lesson, but not one tenth of the facts of natural science can be hitched to a poem. The attempt to force such associations in teaching results in fantastic and even ridiculous combinations. It may even be questioned whether the true function of nature instruction may not thus be seriously subverted.[1]

Unification in Actual Instruction.

It is seen from this brief survey that the principle of unification, or, if preferred, concentration, is most readily and helpfully applied in primary instruction; and that its most promising applications are in teaching *allied subjects* within the several

Most Helpful in Primary Instruction

[1] "Red Riding Hood contains some very false teaching if it is to be treated as science. Bring it in as science and it loses its own peculiar interest and misleads the pupils in regard to the facts of nature."—PROFESSOR CHARLES H. JUDD, New York University.

coördinate groups, and also in teaching other subjects that have closely related facts, as geography and history, which have many complementary phases. In these several directions the intelligent application of the principle may give valuable results. It has, however, small claims to be considered a general method of teaching. It is a principle to be utilized rather than a method to be followed.

Special Methods.

Partial Methods.

It is common to designate methods or ways of teaching by some characteristic feature, as the word method and the sentence method in reading, the ratio method and the measurement method in arithmetic, the diagram method in grammar, the interlinear method in language, the ratio method, the concert method, the individual method, the manual method, the topical method, etc. Several of these special methods have been exploited as if they determined the efficiency and success of school instruction. There is a strong tendency among teachers to make a hobby of minor methods and devices, and the more the mind becomes interested in a special device, the larger the device appears. As a corrective of this tendency it is important that teachers see that these special methods have only a partial function, and hence a very limited application and utility in actual teaching.

CHAPTER VII.

THE DRILL.

IT is shown in Chapter IV. that one of the two important ends to be obtained in the teaching process, called the *drill*, is the training of power and skill, especially skill in the several school arts; as reading, language, number, writing, drawing, singing, etc. These are the fundamental arts not only of the school but also of civilization, and the early acquisition of skill therein is of the highest value, not only as a necessary element of school training but in practical life.

The Drill.

In Chapter III. the principles that underlie the acquisition of skill in any art are clearly and fully stated. It remains to apply these principles to the conduct of the drill when skill is its special end. In this study it must be kept in mind that power and skill are trained only by action; that every act of the soul increases the power to act, and leaves a tendency to act again in like manner. This is not only true of psychical activity, but, within certain limits, it holds true of bodily activity, and especially of the activity of the senses; as the eye, the ear, the touch, etc. What is true of a first action is true also of its repetition. Every repetition of an act increases both power and tendency, and thus through repetition an act may "repeat itself"; that is, become automatic (p. 45).

Acquisition of Skill.

It is thus seen that the characteristic feature of the drill with skill as its end is *repetition* or *practice*. It is its special function to provide, guide, and inspire needed practice. Skill in reading or music cannot be acquired by simply studying the principles of these arts. Indeed, a knowledge of these principles may be acquired without any added skill in either art. The chief value of such knowledge is as a means of *guiding practice*, and this, as previously shown (p. 49), appears in a later phase of art training. Knowledge divorced from practice gives no skill in any art.

Repetition and Practice.

Another principle to be carefully observed in conducting a drill is that skill in any art is trained only by the repetition of *acts*, not by repeating *words*. This follows from the fact that every power is trained by its own activity, and not by the activity of another power. The ability to act in a given direction is trained only by acting in that direction. Hence, in conducting a drill in any art care must be taken to secure *a repetition of acts*.

Repetition of Acts.

The old-time practice of teaching number combinations and tables by drills requiring pupils to repeat over and over the words, flew in the face of this principle. The words were repeated as sounds without the mind's actually seeing the number relations expressed. A visitor to a primary school in one of our large cities witnessed a drill on the number seven which he thus describes, using figures to save space:

Word Repetition.

"The pupil at the head of the class rose and said: 7; 6 and 1 are 7; 1 and 6 are 7, and this was repeated by sixty pupils in turn, each rising. The drill proceeded:

HEAD PUPIL: 7; 5 and 2 are 7; 2 and 5 are 7 — repeated in turn by all.

HEAD PUPIL: 7; 4 and 3 are 7; 3 and 4 are 7 — repeated in turn by all.
HEAD PUPIL: 7; one 6 in 7 and 1 over — repeated in turn by all.
HEAD PUPIL: 7; one 5 in 7 and 2 over — repeated in turn by all.
HEAD PUPIL: 7; one 4 in 7 and 3 over — repeated in turn by all.
HEAD PUPIL: 7; two 3's in 7 and 1 over — repeated in turn by all.
HEAD PUPIL: 7; three 2's in 7 and 1 over — repeated in turn by all.
HEAD PUPIL: 7; seven 1's in 7 — repeated in turn by all.
HEAD PUPIL: 7 is 7 times 1 — repeated in turn by all.
HEAD PUPIL: 7 is 3 times 2 plus 1 — repeated in turn by all.
HEAD PUPIL: 7 is twice 3 plus 1 — repeated in turn by all.
HEAD PUPIL: 7 is once 4 plus 3 — repeated in turn by all.
HEAD PUPIL: 7 is once 5 plus 2 — repeated in turn by all.
HEAD PUPIL: 7 is once 6 plus 1 — repeated in turn by all.
HEAD PUPIL: 7 is once 7 — repeated in turn by all.
And the number seven was exhausted!"

It is evident that the result of this exercise would have been about the same if all the pupils in the class, except the head one, had been parrots with the gift of imitating sounds! No pupil, except the one at the head, was obliged to see a number relation vocally expressed. The drill, if desirable, could have been effectively conducted in one third of the time, and every pupil obliged to see each number relation.

In another school twenty minutes were devoted to finding $\frac{2}{3}$ of 6, $\frac{2}{3}$ of 9, $\frac{2}{3}$ of 12, and $\frac{2}{3}$ of 15. The teacher found $\frac{2}{3}$ of 6 and the process was repeated in turn by twenty pupils. A pupil then found $\frac{2}{3}$ of 9, another $\frac{2}{3}$ of 12, and another $\frac{2}{3}$ of 15, and in each case the process was repeated in turn by all the pupils. How easily the exercises could have been so conducted as to necessitate the mental solution of each example by all the pupils, the examples also including $\frac{2}{3}$ of 18, $\frac{2}{3}$ of 24, $\frac{2}{3}$ of 21, $\frac{2}{3}$ of 30, $\frac{2}{3}$ of 60, etc. In such a drill no pupil should be permitted to repeat after another.

Another Example.

These senseless drills are given as illustrations of the sad waste of time in our schools by parrot exercises in mere word repetition, largely by mechanical imitation with no corresponding mental activity. There is also a like waste in the repetition of manual movements by mere imitation, as in the arts of writing, drawing, and construction. This mechanical repetition has its culmination in simultaneous exercises, all the pupils repeating in concert the words of the leader, as was once common in spelling, reading, and number.

Parrot Exercises.

It is also to be noted that while skill in the several school arts is acquired by practice in which actions are repeated, *it must be guided practice.* No art is learned by mere practice, mere doing. Practice to be fruitful in skill must be the realization of ideals in the mind. In singing, for example, the learner must mentally hear the tones that he is to produce with his voice. He thus puts his mind and his will into vocal effort, and thus comes into skill. The same is true in the manual arts of writing, drawing, etc. The hand produces or realizes forms that are in the mind. The vital thing in directing a practice drill in any art is to occasion in the minds of pupils *clear ideals of what is to be produced.* These inspiring ideals will not only guide practice, but they will awaken interest and thus secure attention and effort (p. 47).

Guided Practice.

But the drill has also for its end the making of knowledge clearer and thus more permanent (p. 53), and here the principles above stated are of the highest practical importance. It is not enough to secure this end that pupils repeat *in words* what they have learned. Word repetition does not add to the clearness of one's knowledge. What is needed is the

Making Knowledge Clearer.

reknowing of what has been known, and this with the view of knowing more clearly and fully. Few objects are fully known on first presentation. It takes, for example, more than one exercise to teach a cube. In the first observations attention is directed to the more prominent features or qualities, as the number, form, equality, etc., of its faces; but in the second study attention is more distributed, new facts are learned, and relations more clearly seen. The same is true of lessons on plants and animals, though in all strictly observation lessons, the repeating of knowing acts is incidental and largely unconscious. "The second time," says Hoffding, "everything is taken in more clearly and distinctly, without it being necessary to think of the first time."

The drill as a means of making knowledge clearer has most value in teaching knowledge that is reached by analysis, or by induction or other form of generalization. To attain the desired end here the *process* of knowing must be repeated, and each repetition, within limits, makes the fact or principle clearer. It is this principle that gave vital meaning to the historic maxim of the Jesuits, to wit: *Repetitio mater studiorum.* Repetition is the mother of learning only when the *acts* of learning are repeated. The mere repetition of words, so long the weakness of the old-time schools, was much better fitted by the maxim, *Repetitio mater stupidorum.*

Maxim of the Jesuits.

No mistake in teaching has been more serious than the assumption that knowledge is taught by the iteration and reiteration of words. This was the fatal error of what is known as the Lancaster system of instruction, which in the early part of the nineteenth century occasioned so great a sensation in England, and

The Lancaster System.

subsequently in the United States and Canada. In this system, designated as "monitorial and mutual instruction," the lessons were taught orally by the master of the school, with responses by all the pupils in concert, and then these were fixed in the memory by repetition under monitors, the pupils being divided into groups for the purpose. The master taught the lessons, and the monitors, themselves pupils, heard the lessons repeated. The pupils thus taught made apparently very rapid progress, and the most extravagant claims for the system were made by its advocates. In a letter to Governor De Witt Clinton in 1826, Mr. James Wadsworth said:

"Arkwright's discovery and the subsequent improvement are not more important to the manufacture of cotton than the Lancaster system to an infinitely more important object, the education of our youth."

But the sanguine advocates of the "new system" were doomed to disappointment. It was found by trial that many of the pupils could not repeat separately what they recited with such vocal energy in chorus; and that the ideas, which they associated with the sounds repeated, were often ridiculous in the extreme.[1] The system was short lived wherever introduced, especially the monitorial feature, but its stupid concert drills continued in American schools as a persistent evil for fifty years. It would afford the writer special satisfaction to be able to express the belief that this evil practice has wholly disappeared from our schools.

Failure of the System.

[1] There has been nothing more marked or discouraging in the history of school progress than the readiness of teachers and school patrons to accept pretentious new "methods" and "systems" of teaching as revelations, pregnant with school reform. The Lancaster system is an illustration. Even eminent educators were attracted and deceived by it.

Abuses of the Drill.

The drill is liable to obvious abuses in school training. One of these abuses, more properly, perhaps, misuses, is the *aimless* drill, a sort of crank-turning without definite aim or purpose. In no teaching process does the teacher need clearer aims than in the drill. It is not enough to have in mind a general result to be attained, much less to be guided by a vague and indefinite purpose. The drill must be guided by clear and definite results as ends. If, for example, the purpose of a particular drill is to train vocal power, it must aim at some special vocal quality; if to train skill in number, it must aim at number skill in some special process. The more definite and immediate the aim of the drill, the higher will be the resulting skill. The result attained in the drill is the evidence and test of its success.

Aimless Drills.

Another common abuse of the drill is its continuance after the desired results have been attained. This may be characterized as the *excessive drill.* In the practice of some teachers the drill is a machine to run according to the time-table, a device for marking time when there is nothing else to do. Nothing in school work can exceed the uselessness of some of the so-called drills to which pupils are often subjected. The greater part of a spelling drill may be spent on words which no pupil has misspelled or can misspell without a special effort. Pupils are required to drone over reading lessons which they know by heart, and to reread them when there is not the least gain either in grasp of thought or in its vocal expression. Pupils waste time in mechanically writing page after

Excessive Drills.

page, the writing actually growing worse from the top to the bottom of every page. They are required to solve problems over and over, which they first solved at a glance. Young pupils may be kept combining and separating groups of objects after they can readily add and subtract the corresponding concrete numbers, and even the abstract numbers; they may be kept inspecting blocks to determine ratio which they have learned by heart. Drills with blocks may be made as useless and senseless as drills with match sticks, or even in counting by naming the successive numbers, and this can certainly be made sufficiently stupid to illustrate what is possible in this direction. The waste of time in useless and excessive drills is often a serious evil in school work. The saving of the time thus wasted would afford time needed for important instruction now neglected. The right use of the drill requires preparation, watchfulness, judgment, and forethought.

The abuses of the drill culminate in *simultaneous* or *concert* repetition. Happily this form of abuse is not so common in American schools as it was thirty years ago. Concert exercises have now a small place in our best schools, and even in exercises in singing provision is made for individual practice and testing. In a few cities the use of the concert drill, except in singing, has been forbidden by the school authorities; but the increasing disuse of concert drills has been chiefly due to the fact that teachers, as a class, are seeing more clearly the true function of the drill, and the failure of concert repetition to give desired results. It certainly ought to be possible to correct the misuse of the concert drill without absolutely forbidding its use. It is true that it has a comparatively small place in

Concert Drills.

school work, and is easily liable to overuse, but it may have important value when used by a wise and skillful teacher. This is true not only in drills in singing, but also occasionally in reading, and, for special purposes, in other exercises.

CHAPTER VIII.

THE TEST.

THE purpose of the test as a teaching process is *to disclose the results of instruction, drill or practice, and study.* As stated in a previous chapter, it is the eye of teaching. The teacher needs to know as he proceeds the pupil's attainments, and in the absence of such knowledge no skillful teaching is possible. At every step in the teaching process the results of the preceding steps must be known, the clearer the better. Indeed, it is difficult to see how the simplest lesson can be skillfully given without a knowledge of results as the exercise proceeds. In disclosing results, the test guides and energizes the process, and is otherwise an essential factor in teaching.

Its Function.

But concurrent and incidental testing of results is not sufficient. It is also necessary to test results when teaching processes are completed, the results not only of single lessons but also of series of lessons. This makes a place for the formal test exercise in school training, — an exercise that surveys the ground covered, discloses unsatisfactory results, and thus suggests needed supplementary instruction and reviews. These searching test exercises are very important. As a rule teachers overestimate their pupils' attainments, and pupils as a class know much less than they think they know. The searching test is an eye

The Formal Test.

opener. It undeceives teacher and pupils; may, indeed, take the conceit out of them, and in this there is often great gain. The test is a needed help in both teaching and learning.

The results of teaching and study that need to be tested are *knowledge*, *power*, and *skill* (p. 26), and each of these results is tested by means peculiar to itself. Knowledge is chiefly disclosed *by its expression*, but this method of testing what one knows is not so certain as it seems. The memoriter expression of knowledge is uncertain evidence that pupils know what they verbally express. Pupils may repeat accurately statements of facts and have no knowledge of the facts. Hence in testing knowledge by its expression it is necessary to secure such expression as makes evident the fact that the pupil knows what he says, not always an easy task. The essential thing is to put tests in such a way that they cannot be met by repeating memorized language. The evident exception here is in testing the pupil's ability to reproduce certain statements accurately, the testing of verbal memory, rather than knowledge, and this is sometimes important.

Knowledge tested by Expression.

Knowledge may also be tested *by its application or use, direct or indirect.* This is sometimes a more satisfactory test than expression, but its special value is the evidence it furnishes that what is expressed is understood, a corroborative test. It is, however, not possible to apply this test to all teaching results, but it may be often used in the art studies and also in other branches, especially in the physical sciences. A pupil's knowledge of climate, for example, may be efficiently tested by the study of a continent or even a

Application or Use.

country. The writer once conducted such a test, using South America for the purpose, and the result was most satisfactory as evidence of the pupils' elementary knowledge of the subject of climate. The teacher should be watchful for opportunities to use the results of training.

Power is tested *by its exercise* and this is true whatever the power and whatever the direction of its activity.

Power tested by Exercise.

The power to see the relations of numbers in a problem is tested by its solution since this involves the seeing of these relations; and, for a like reason, the power to see the relations of the words in an English sentence is tested by its analysis, which involves thought analysis. Years ago the principal of a Cleveland grammar school, who prided himself on his ability to teach English grammar, said at the close of an examination which tested the thought power of his pupils, "I can teach English grammar, but I cannot give pupils brains!" In all tests of formal knowledge his classes stood high, but in the analysis of sentences requiring considerable thought power, they disappointed their teacher.[1] The teaching of technical grammar to young pupils involves the gift of thought, if not of "brains." It certainly requires long and progressive training in thought analysis to give young

[1] Those who advocate the early teaching of technical grammar overlook the fact that the relations of words in an English sentence are not determined by word forms, but largely by the analysis of the thought, a much more difficult thing. In inflected languages, the relations of the words in a sentence are chiefly indicated *by the forms of the words*. This explains the ability of French or Italian children to become proficient in grammar at a much earlier age than English or American children. The English language has comparatively few grammatical forms, and hence English grammar is not a form study. The grammar of an inflected language is a form study and largely objective.

pupils the power to see the relation of words in English sentences, except the simplest, and for the reason that the discerning of these word relations is not a form or eye matter but a thought process.

Skill is tested *by doing or action*, and usually the doing must be observed to determine the degree of skill. The pupil's skill in reading is shown by reading; his skill in singing by singing; his skill in drawing by drawing, etc. It is true that in the graphic arts, as writing and drawing, one's skill may be judged in part from specimens, but only in part. An important element in skill is *time*. It is not possible to judge satisfactorily of the skill of two penmen by specimens of their writing. One may have spent an hour on his specimen; the other only ten minutes. A pupil who can write ten lines beautifully in five minutes has certainly higher skill than one who, to write ten lines equally well, requires twenty minutes. Indeed, many of the specimens shown in school exhibits are not specimens of writing but of *word drawing*. The same is true of specimens of drawing, though perhaps in less degree. In order to judge of the actual skill of pupils in drawing, it is necessary to know the time spent on the final specimen and also the time spent in practicing upon it in preparation, the assistance received, etc. When the manner in which drawing exhibits were prepared is not known, but little value can be attached to them as evidence of the comparative skill of pupils or schools. Many exhibits are practically worthless as a means of comparing school work.

Skill tested by Doing.

Inasmuch as the training of power and skill is a vital function of teaching, it follows that the search for resulting power and skill is a most important func-

tion of the art of testing. It is just here that much of the testing in our schools is weak, not so weak as formerly, but still unsatisfactory. The tests even now used largely call for knowledge, this being specially true of written tests.

Testing Power and Skill.

The writer recently examined a written test in English in a large western city, a test prepared by the superintendent and submitted to all the pupils in a given grade of the schools. Twenty of the twenty-five questions were tests of formal knowledge or, more properly, of formal statements of knowledge committed to memory. Five of the questions tested power or skill, but only two had special merit, and this in a branch in which skill is the important end sought. It is believed that three fifths of the written tests still used in American schools test knowledge, often mere memoriter knowledge, — what Mr. Quick, of England, calls "examination knowledge"; that is, knowledge carefully formulated and put in the memory ready for delivery on examination day!

Example.

The test exerts a positive influence on the other teaching processes. If the tests used in teaching emphasize knowledge, training will be slighted and cramming encouraged, and this will be specially true when tests are satisfied by the repetition of language learned by heart. If the tests are narrow and technical, the instruction will be narrow and technical; if the tests run to figures, the instruction will run to figures; if the tests demand details, they may emphasize and make imperative all "the lumber of the text-books."

Influence of Tests.

What is true of the influence of the test on teaching is true, in a higher degree, of its influence on the pupils' work, particularly on book study. If the tests touch

only the memory, the pupils will memorize; if the tests touch the understanding, pupils will strive to understand the subjects studied; if the tests are superficial, the pupils' study will be superficial. It is, indeed, not too much to say that teaching and study are never much wider or better than *the tests by which they are measured.* It is certain that the work of a school never rises much above the teacher's tests.

Influence on Pupils' Work.

Modes of Testing.

We have learned that knowledge may be tested by its expression and by its application, but it remains to consider the manner in which tests shall be put before the pupil.

Tests of knowledge may be presented to the pupil in two different ways, in the form of questions and in the form of topics. The first is known as the *catechetic* or *question* method, and the second as the *topic* method. Questions as tests may be more definite, and they usually require a briefer response than topics.[1] A topic may indicate only the general character of the knowledge sought, and, as a rule, the more general the topic, the less definite and searching it is as a test.

Testing Methods.

The chief merit of the question method of testing knowledge is its *thoroughness*, but this result necessarily depends on the character of the questions. Superficial questions may be met by superficial answers, but, on the contrary, questions may call for knowledge that is fundamental. There is no other test of knowledge so searching and thorough as a series of well-directed questions.

Advantages of Question Method.

[1] See "Elements of Pedagogy," pp. 177–182.

The question mode of testing permits a *systematic unfolding of the subject*, an important advantage. It gives the teacher the control of the order of the topics and also of the included facts, and thus due prominence can readily be given to the more fundamental and vital. Such a systematic review of a subject greatly clarifies the pupil's knowledge.

Another Advantage.

While this is true in the recitation, the question mode of testing fails to secure systematic thought in study. This defect is greatest when the pupil's study consists in attaching ready-made answers to questions in a book, a process that may be made about as mechanical as the fitting of pegs to holes of different sizes. A pupil may thus learn the answers to scores of questions concerning a given country without forming a conception of it. His knowledge is in fragments.

Another advantage of the question mode of testing is the opportunity which it affords for *incidental instruction*. When searching questions show that explanation or illustration is needed, the same can be given with comparatively little sacrifice of testing efficiency. The pupils are in a favorable condition to receive such instruction, and it may usually be given in few words. The one result to be carefully avoided in a recitation is the dissipation of the test by instruction. It is easy for a teacher to subordinate testing to mere talking, the temptations to such a waste of time being abundant.

Third Advantage.

To secure these advantages, the questions used as tests should be *clear*, *concise*, and *definite*. The first requisite in answering a question is its clear comprehension, and hence the importance of its being stated clearly and concisely. An ambiguous

Character of Questions.

question occasions hesitancy and confusion, and the same is true of a wordy question, while an indefinite question invites a loose and pointless answer. As a rule, a question should be as concise and definite as the answer it solicits.

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All questions that suggest the answer, technically called "leading questions," are worthless as tests, and should be carefully avoided. The same is true of questions that can be answered by *yes* or *no*. Whatever may be the pupil's ignorance, he is more likely to answer such questions correctly than incorrectly. The manner in which the question is asked, the suggestive look of teacher or fellow pupil, unconscious it may be, or some other hint, may make correct guessing quite easy. It usually takes a very dull pupil to miss a "yes-or-no" question. The practice of helping pupils in recitations by leading questions or otherwise is pernicious. It deceives the pupil and fosters bad habits of study.

Questions Worthless as Tests.

While questions may be excellent tests of knowledge, they are not so satisfactory as tests of *expression*. This weakness may be partly overcome by requiring pupils to give full and complete answers, answers that clearly express the thought; but even this may fail to test the pupil's power to express properly several consecutive thoughts. Many of the answers accepted in schools, even in recitations, consist of a single word or two or more words not forming a sentence, — answers admissible, it may be, in drills, or in rapid reviews, but not in a formal test exercise. Here, at least, pupils should be held to the complete and accurate expression of their knowledge. It is certainly not a good practice for teachers to use more

Tests of Expression.

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words in asking questions than pupils use in answering them.

The most obvious merit of the topic mode of testing is its value as *a test of expression*, omitting here any consideration of its great merit as a training in expression. In reciting a topic the pupil is obliged to tell what he knows in successive sentences, and this is obviously a much better test of his power of expression than the giving of brief answers to specific questions.

Topic Method.

The meeting of the topic test of expression also necessitates *systematic thought in study*. The pupil is obliged to arrange the facts under the several assigned topics in some definite order. More advanced pupils may be required in study to make a definite analysis of the several general divisions of a subject and to follow these analyses in reciting. This affords an excellent training both in thinking and expression. It is not enough for the pupil to study knowledge as classified by another mind. As he advances in the course the work of classifying and arranging his knowledge should be done increasingly by himself; and, to this end, the recitation must call for such study.

Training in Thought.

A comparison of these two ways of testing pupils shows that they supplement each other, one being weak where the other is strong, and *vice versa*. The question method is strong as a searching test of knowledge, and this is the weak feature of the topic method, as often used. The question method is comparatively weak as a test of expression, and the topic method is strong in this direction. Testing by questions permits incidental instruction, and testing by topics affords small opportunity for such instruction. These and other contrasts

show that the best results may be secured by the *union* of the two methods in a practical manner. This may be accomplished by permitting pupils to recite, as well as study, mainly by topics, and following the recital of topics by questions or, in more advanced classes, interjecting questions. This may be readily done even in such a study as geometry. When a pupil in reciting a topic fails to show satisfactory knowledge, he should be plied with searching questions. This requires the teacher to be on the alert for fit occasions thus to increase the efficiency of the topic test. In primary classes questions are generally used both for instruction and testing, and even in sub-grammar grades, especially in lower classes, the topic method has its chief use in reviews.

Union of Methods.

Since power and skill are largely tested by action or doing (p. 92), these tests are presented to the pupil in the form of directions. Thus: "Solve problem 15"; "Analyze the sentence 'To err is human'"; "Draw the vase on the table"; "Sing the measures of music on the board," etc. This, as must be readily seen, is a form of topic test. The thing to be done is put before the pupils in such a manner as to indicate clearly the work or task assigned. The same form may be used in testing certain kinds of knowledge.

Directions as Tests.

It is thus seen that testing is a difficult art, whatever the method employed. The art of asking questions requires a clear and systematic knowledge of a subject, a ready command of good English, and a distinct and intelligent aim. There has never been a much more stupid practice than "the asking of questions from the book," now happily disappearing.

Testing a Difficult Art.

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The author's questions may be models in form and arrangement, but their use degrades the teacher to a mere machine and reduces the recitation to a mechanical and lifeless routine. The only proper use of such questions is in preparing for the recitation; by the teacher as a means of increasing his skill as questioner, and by the pupil in testing his knowledge, especially in general reviews. The skillful use of the topic method requires a clear headed, thorough teacher. In the hands of a superficial teacher the recitation degenerates into mere talking *about* subjects, the pupils often failing to state what is most essential to be known, giving instead comparatively unimportant details. Such recitations are exceedingly deceptive as tests, as well as destructive of right habits of study. The pupil needs to learn that talking *at* topics is not reciting topics.

The Oral Test.

It requires no small degree of skill to conduct successfully an oral test, an eye-to-eye and mind-to-mind search for desired results. The difficulty of such a test is greatly increased when pupils recite in large classes. This has doubtless facilitated the adoption of the written test, now so widely used, often without seeing its limitations, especially as a test of power and skill.

The Concert Test.

But a more serious mistake has been made in the use of the concert or chorus method of testing pupils in classes. This was the great error of Joseph Lancaster and the advocates of his system. It was taken for granted that what pupils could recite together in concert they knew and could tell individually. The intelligent application of the individual test exploded the system. It was found that pupils were reciting in concert with one voice what they

could not tell separately and of which they had often no real knowledge. The writer once witnessed the testing of three hundred pupils as to their ability to sing a certain grade of music at sight. They sang in chorus without hesitation three pieces of music which they had never seen before, and the examiner marked the class "perfect." It was, however, ascertained by proper testing that not more than one pupil in five could sing the same pieces *alone*. The chorus singing had really been led by a few voices, and this is true of much concert reciting. Pupils in Sabbath schools are still reciting in concert the catechism and selections from the Scriptures; and this, not as a means of learning what is recited, but to show that it has been learned.

Example.

These examples ought to suffice to show the misleading character of concert testing. It seems strange that such a method of testing should ever have been used by intelligent teachers, but its continued use after years of failure is still stranger. The persistence of error in teaching seems to be an approach to the persistence of force in nature.

All that has been said above emphasizes the importance of a most careful study and mastery of the art of testing. What has been learned of its function and methods prepares the way for an intelligent study of its use in testing pupils in classes, especially the use of the oral test. This will be more fully considered in another chapter.

CHAPTER IX.

ORAL INSTRUCTION.

THERE is an increasing amount of knowledge in school courses that must be taught by the living teacher, without a text-book in the hands of pupils. This is true not only of all knowledge that must be taught objectively (p. 61), but also of those subjects that find a place in the course before pupils have the ability to acquire such knowledge from books. These subjects, if learned by young pupils, must be taught orally. The demand for this oral instruction is increasing from year to year, especially in elementary schools; and it is vitally important that teachers become skillful in such instruction. Oral teaching is a difficult art, an art that requires most careful study.

Oral Lessons.

It is important to note here that there are many exercises in the modern elementary school, especially in primary classes, that are not instruction in the sense in which the term is herein used. Their guiding end is not knowledge, or power related to knowledge, or even skill in any school art. Their aim, so far as they have a conscious aim, is to give bodily relief, to afford pleasure, even amusement, to make impressions upon the sen-

Non-instruction Exercises.

sibility, to awaken feeling, to quicken the moral sense, to cultivate æsthetic taste, to stimulate the imagination, etc. The value of these exercises is freely conceded, since, in the training of the young, moral, æsthetic, and physical development is quite as important as intellectual development.

But these exercises, though attractive and useful, are not instruction. They fall in the teaching process only so far as they result in knowledge or in such intellectual feelings as interest, curiosity, wonder, etc., thus whetting the mind's appetite for knowledge. If a competent observer should seriously undertake the task of ascertaining the results of many of the exercises in primary schools, he would be surprised at their small contribution to the pupil's real knowledge or to his power to acquire such knowledge. He would find many exercises that result only in impressions, often in mere sensations. This is specially true of those myths, fairy tales, wonder stories, etc., that appeal to the sensibility and the imagination, but have little or no basis in *reality* as known by children.

Extent of Such Exercises.

The question thus raised does not relate to the *value* of these exercises in school training, and it is certainly not a question of their comparative value. It is simply a discrimination of school exercises that differ in their aim and method, and this with the view of limiting the present study of instruction to that distinct teaching process that has for its end knowledge and the training of the power to know, *a training possible only through knowing.* Instruction in this sense is a definite process and is capable of intelligent study.

Instruction Exercises.

Instruction Independent of Text-book.

In order that the following suggestions may be as definite and helpful as possible, they are made with special reference to oral instruction above the third school year where such instruction has more definite knowledge as an end, and hence may be more systematic in form. In the lowest grades instruction seeks to develop primary ideas and facts, to teach the common qualities and relations of things, their names and symbols, etc., instruction of the highest value, it is true, but less formal and systematic than in higher grades. Moreover, much of the knowledge taught in primary grades is more or less closely related to the learning of some art, as reading, language, number, music, etc., instruction and drill or practice being united in the same exercises. Even the early lessons on plants and animals, and other nature lessons, may properly look more to the cultivation of a love of nature and the sense of the beautiful than to a real, much less a scientific, knowledge of the objects presented. Such instruction is necessarily free and more or less informal.

Instruction in Lowest Grades.

We are now prepared to consider the conditions which are necessary to the highest success in the art of oral instruction. Among these requisites are: (1) *the faithful preparation of the lesson by the teacher*, (2) *fidelity to this preparation in teaching the lesson*, and (3) *the reproduction and review of lessons by the pupils, first individual lessons and then series of lessons.* It will be seen in what follows that each of these conditions is essential to complete success in teaching subjects orally.

Necessary Conditions.

I. The Teacher's Preparation.

1. It is an axiom of oral instruction that the teacher must have *a clear and definite knowledge of the subject taught.* This preparation is important in any teaching exercise, but it is essential in instruction. No one can teach another what he himself does not know. What the teacher knows vaguely, he will teach vaguely; what he knows clearly, he may teach clearly. **Knowledge of Subjects.**

Moreover, the teacher's knowledge not only must be clear and definite, but it must be *fresh*, the result of recent preparation. No one can teach successfully out of last year's study. He must bring to the work of instruction the fresh results of recent study. In another place[1] we have considered the relation of a thorough and fresh knowledge of the subjects taught to the easy control of pupils. The relation of such knowledge to successful instruction is still more vital. The fresher the teacher's knowledge, the livelier his interest; the livelier his interest, the keener the pupil's interest; the keener their interest, the closer their attention; and, as a result, the easier and fuller their mastery of what is taught. Besides, in the presence of his class the teacher has no time for efforts to recall what is forgotten or indefinite, or to run down some new truth. All his powers need to be in ready command. He must be quick to follow his pupils' activities, to discern what they know, and to see where light is needed. All this requires fullness and freshness of preparation. **Fresh Knowledge.**

Nor is it enough that the teacher have a thorough and fresh knowledge of the subject to be taught. His

[1] White's "School Management," pp. 21–26.

preparation must determine *what is to be taught.* His knowledge may be much wider than the proper limits of the lesson, since this must be adapted to the mental condition and ability of the pupils. For example, it is not possible for young children to comprehend the wider relations of things and events, and especially their causal relations. "Children," says Dr. De Garmo, "can make simple association of facts, but they see no far-reaching unifying principles." There may be a "causal flexus" that binds all knowledge into an organic unity, but young children are not philosophic spiders that gather knowledge by excursions over a web of philosophic causation. Human knowledge is the result of human knowing, and hence every branch of study has its natural phases that correspond to the psychical phases through which pupils pass as they ascend in the grades. This fact should be kept in mind by the teacher when determining the knowledge to be taught in a given lesson. It is often quite as important to see what not to teach as it is to determine what to teach.

The Lesson.

An oral lesson cannot be mapped out solely or chiefly from the standpoint of the subject to be taught. The capability of the learner must also receive consideration. It is not possible, and it is certainly not desirable, to attempt to teach subjects exhaustively or even logically in primary schools. Only the more elementary phases of these subjects can be thus early taught or acquired.

Adaptation to Capability.

It is not necessary that all lessons to be taught orally should be prepared in writing, as has been urged. The essential thing is for the teacher to know clearly and fully the facts to be taught, to have them not only within possible reach but fresh in

Written Outlines.

mind. There may be advantage in the study of a lesson to note the leading facts, even to express them in the best possible form, but such notes will have small use in actual instruction. To write out all the facts to be taught, or, what is worse, the questions that are to be used in their development, is to put upon the elementary teacher an unreasonable burden, without any compensating increase in teaching skill. It will be found an excellent plan to arrange the subject-matter of a lesson in topics, thus indicating not only what is to be taught, but the order of presentation, the requisite to be next considered.

2. The teacher's preparation must determine not only the facts to be taught but also *the order of their presentation.* The facts in a simple lesson have their proper sequence, and it is important that this sequence be known and followed. The sequence to be observed in teaching facts is not necessarily their logical order. Indeed, the logical order of facts is usually not the order in which they are best taught or acquired. It is the psychical sequence of knowledge that chiefly determines the order of its presentation in instruction. This order usually begins with what is known. The maxim, "From the known to the related unknown," has special application to the subject-matter of an oral lesson. To bring the known clearly into consciousness it may be necessary, as will be shown later, to reproduce what has been taught.

Order of Presentation.

A knowledge lesson should begin with the known and develop in proper order the subject, and the facts thus grouped should present a whole, *a unit of knowledge.* It is agreed by nearly all writers on teaching that every lesson should be a unit, not a

Lesson a Unit.

scatteration. Facts closely related to the subject developed may properly be introduced for explanation or illustration, but there should be no lugging in of facts for the sake of mingling different subjects. The true theory of concentration has no justification for the mechanical mixing of studies in the same lesson. The attempt to make a lesson in geography, for example, also a lesson in arithmetic, history, literature, mythology, etc., is almost sure to result in fantastic combinations, and what is worse, in a sad dissipation of energy. The Ziller theory of the concentration of studies around one central core is accepted by few American educators (p. 77), and few of these would do the mixing in lessons. The subject-matter of an oral lesson should be presented in proper sequence, and the determining of this sequence or order is an essential part of the teacher's preparation. This demands the exclusion of non-related facts, howsoever interesting, and the development of the lesson as a group of unified knowledge.[1]

3. The teacher's preparation of a lesson must also determine *the methods to be used in teaching the several facts.* As shown in a previous chapter, some knowledge must be taught objectively; other knowledge by the indirect or training method; and other knowledge must be taught directly by means of language and illustration. The teaching of the several

Methods to be used.

[1] "Every study that is important enough to be a study has its appointed time in the program during which it dominates the work of the hour, and everything else is incidental and secondary. . . . To branch off into some other subject, no matter how closely connected, and to become absorbed in its treatment, means simply to be side-tracked, to lose one's bearings, to be guilty of illogical and unsystematic thinking." — CHARLES A. MCMURRY in "Second Year Book" of National Herbart Society, p. 19.

facts and principles grouped in a lesson may involve the use of all three of these methods. Moreover, while methods of instruction are primarily determined by the nature of the knowledge taught (p. 59), there must be *an intelligent adaptation of methods to the capacity of pupils.* The use of the objective method also involves the preparation of materials. These facts make a study of the methods to be employed in teaching a lesson, a very important part of the teacher's preparation.

Adaptation of Methods.

In determining the order and method of presenting different lessons, care should be taken to avoid running them into one mold. It is easy to adopt a general lesson plan and then force the presentation of every lesson into it. Such a procedure is almost sure to become a monotonous routine, devoid of spontaneity and life. It hardly needed Krapelin's experiments to show that monotony of thought and feeling is a source of fatigue. It is always a difficult task to sustain interest under the stupefying influence of sameness, and this is specially true in oral instruction. While there must be an orderly procedure in a lesson from beginning to end, there must be variety and freshness.

Lesson Plans.

The lesson plan was one of the early hobbies of the normal school. When the writer first began to visit schools, he found it easy to recognize the graduates of certain normal schools by their method of presenting lessons. In the fifties the writer gave one of these general lesson plans, then coming into vogue, a trial in teaching geography in a Cleveland grammar school. The plan thus tested outlined in the form of general topics a definite series of facts to be

Early Experience.

learned in their order in the study of every continent and country. In the study of political divisions, especially the American states, it became a dreary routine, and was soon abandoned for freer work under the guidance of special topics for each country studied.[1] The order and the method of oral instruction should have special reference to the individual character of the lesson to be taught. No two lessons permit precisely the same presentation.

Objection.

It may be objected that the preparation for oral teaching, indicated above, is not within the teacher's ability, especially when several oral lessons are to be given daily in addition to other exercises. But this is an objection to the attempt to teach many subjects orally, excepting in lower grades where lessons are necessarily brief and closely related. In upper grades, it is far better to give fewer oral lessons each week than to give these lessons in a haphazard way. Oral teaching is a difficult art, and success is not possible in the absence of thoughtful preparation. Even the brief lessons in primary schools need to be well prepared.

2. The Lesson.

The first requisite in teaching the lesson is *fidelity to its preparation.* The lesson should be taught as planned, the facts presented in proper order, and with

[1] The reader who has seen the writer's early "Class Book of Geography" (now out of print), may recall its special topics for the study of each particular country, topics largely based on the descriptive text of the geography in use. This little manual had its origin in this Cleveland grammar school, a school now somewhat famous. The manual was especially prepared for the use of the pupils in this school, but it took *wings* and flew over the country.

the highest possible skill in the use of methods. There should be orderly progress from start to finish, with the least possible dissipation of energy. The aim should be to lead the pupils to clear and definite knowledge by their own activity. At every step it should be kept in mind that true teaching is *the occasioning of right activity in the pupil;* that it is the pupil's mental activity, not the teacher's, that determines the result.

Fidelity to Preparation.

This advice was recently given a company of teachers:

"Throw your preparation out the window. Look into your pupils' faces for inspiration. Let them ask questions. These questions will show what they wish to know, and what you should teach."

This is certainly very bad advice even for a primary teacher. Pupils may thus be kept mentally active, even tiptoeing, but in most cases there is a sad dissipation of activity. It is the teacher's function to determine the aim and purpose of a given exercise; and the quality and value of the pupil's thought activity will depend largely on the teacher's direction and stimulation. Not only should every lesson have a definite end, but the teacher should guide the pupils to that end. The questions of pupils, when pertinent, should receive due attention, but these should not determine the subject-matter of instruction. There should be few diversions thus occasioned, and these should be fully under the teacher's control. The teacher is the guide and occasioner of the pupil's activity.

Teacher's Function.

In the preparation of exercises the teacher may properly make excursions into other studies for closely related facts, as well as for illustrations; and in primary instruction it is possible to utilize the principle of unification,

somewhat inaptly called concentration. Here the materials for reading and for language may be drawn from different sources, and the arts may often be so united as to make them assist each other. Drawing, for example, may aid language, and, to some extent, reading. But the attempt to realize several purposes in an exercise usually results in weakness and failure, in a scatteration, not in concentration. It is not easy in teaching to kill two birds with one stone. A good teaching exercise is unified activity.

Excursions into Other Studies.

The prior caution against the adoption of a fixed lesson plan in preparing lessons applies equally to the taking of the same formal steps in teaching them. It seems unnecessary to repeat that in all lessons the pupils should be put in the right mental attitude, and that the subject-matter of the lesson should be properly presented and taught. But lessons vary greatly in subject-matter, and hence the steps taken in teaching them must vary. All knowledge is not acquired by the same mental processes, and it follows that all knowledge cannot be taught in the same way or by the same steps. There are lessons, especially in higher grades, in which Herbart's five formal steps may be used with advantage; but there are many lessons, especially in lower grades, which cannot be forced into such a formal procedure without a sacrifice of interest and success. The actual process of instruction should be varied, free, and vital, —not, however, unplanned and haphazard.

Formal Steps.

3. The Reproduction of the Lesson.

It is the opinion of American educators, who have good opportunities for forming an intelligent judgment,

that much of the oral instruction in our schools, especially below the fifth school year, runs to waste and disappears; that this is not only true of mere "impression" lessons, but is also true of exercises that aim to teach knowledge. An inquiry as to the cause of this waste seems to disclose the fact that it is largely due to a failure to utilize the results reached, whether these be knowledge or power, — a failure to correlate properly the knowledge learned in one lesson with succeeding lessons; a failure to keep in hand, if the expression is permissible, the results reached by instruction. Lessons are given well, it may be very skillfully; but, as a rule, the results are not properly reviewed and fixed. Foreign educators who have visited American schools express admiration for the skill, even brilliancy, of our teachers, especially women, in giving oral instruction; but they do not fail to note their weakness as a class in fixing in mind what has been taught, in utilizing results. "It is more important," says Diesterweg, "to retain what has been learned than to learn something new and forget what preceded."

Weakness of American Teaching.

What is specially needed to strengthen oral instruction in American schools is *the reproduction of lessons by the pupils*, a practice in which trained German teachers specially excel. Pupils should have needed opportunity to express what they learn as the lesson progresses, and, at its close, they should state fully and clearly all important facts learned, not the mere details, but the essential facts. This reproduction may be made not only a fine test of knowledge and ability, but also an admirable training in thinking, and in the clear expression of knowledge.

Reproduction of Lessons.

It is true that a skillful lesson is a training not only in knowing, but also in the expression of what one knows; it is also true that such a lesson is a continued testing of the pupil's thinking and knowledge; but the pupil's mental activity during a lesson is under the teacher's direction and stimulation. Results are thus reached, and even relations are seen which are beyond the pupil's unaided effort. In the reproduction of a lesson, the pupil comes to the front and the teacher retires, and this is specially true when the reproduction is guided by topics rather than questions, and still truer when guided by neither questions nor topics. In brief lessons the pupil knows what he has learned, and needs only practice in its expression. A skillful reproduction of oral lessons in American schools would more than double their value.

Reproduction at Close of Lesson.

But it is not enough that lessons be reproduced at the close. They should be again reproduced in all essential facts at the opening of the next lesson, and especially should this be done when the lessons are closely related. Whatever may be true of the correlation of the different branches in a course of study, the successive lessons in each branch should be closely correlated when this is possible. It is a serious mistake to teach the successive lessons in a given branch, each without reference to those that precede or follow. The successive lessons should be so related in instruction that the pupil's progress may utilize all the steps that have been taken. This should be specially true of lessons that constitute a related series. It is not enough that the facts in a given lesson be presented in their proper order, but there should be a *proper sequence in lessons;* not necessarily a logical sequence, but a natu-

Correlation of Lessons.

ral or psychical sequence, the passing from one group of facts to a related higher group.

This suggests the importance of reproducing lessons *in series*, as well as the reproduction of the separate lessons. Whenever a group of closely related lessons is completed, there should be a reproduction of the series by the pupils. What is worth teaching is worth fixing in the memory, not as tied-up facts to be given out in an examination and then forgotten, but as a part of the pupil's comprehensive and sure knowledge of a subject or branch. The value of such training is shown by the admirable manner in which German pupils meet searching tests that cover several years of instruction.

Reproduction in Series.

The necessity of reviewing studies has been called in question, it being assumed that what is once known well will be abiding, an assumption not sustained by experience. But it may certainly be questioned whether pupils can know subjects well if they have not seen their relations to the other subjects in a series. The review of a branch of study as a whole is always helpful.

Reviews.

It is not meant that the reproduction of lessons by pupils should be exclusively oral. On the contrary, as pupils acquire skill in writing, the oral reproduction may be wisely supplemented by the written, the successive lessons being reproduced in writing, and finally copied in a blank book used for the purpose. This is not only an excellent practice in the accurate expression of one's knowledge in writing, but it greatly facilitates reviews from time to time. It is, however, important that special care be taken to secure the use of correct written forms in all such work.

Written Reproduction of Lessons.

Careless and inaccurate written work results in bad habits in writing, habits that become a serious hindrance in acquiring skill in the use of correct written forms (p. 214).

Nor should these reproduction exercises be limited to the oral and written expression of what is learned.

Reproduction by Application.

Whenever practicable, the facts and principles learned should be applied or illustrated by the pupils in assigned seat work. Some lessons, as in physics, may properly be supplemented by the solution of practical problems; other lessons by graphic illustrations, as map drawing and modeling in geography, etc. The hand has an important function, not only in utilizing, but in clarifying the results of oral instruction.

CHAPTER X.

INSTRUCTION AND BOOK STUDY.

SIR ORACLE in pedagogy cries: "Throw text-books out of the window. Teach every subject as if there were no text-book in the universe." In recent years this oracular advice in varying forms has been so often repeated, and with such emphasis, that not a few teachers have come to believe that the use of text-books by pupils belongs to a by-gone régime in school training. Indeed, there are teachers who, if their pupils should be caught by a visitor reciting a text-book lesson, would have the traditional feeling of the man caught with one of his neighbor's sheep on his shoulders! They have such a holy fear of being called an old fogy that they are not a little distressed over the fact that it is not possible to teach reading without the use of a book! The presence of the book suggests an old-time régime. They feel that reading *ought* to be taught without a book in the hands of pupils.

The Text-book.

This effort to discredit the use of text-books in school instruction is strangely paralleled by an equally earnest and more intelligent effort to promote the reading of books by children and youth. This effort takes the form of children's reading circles, circulating school libraries, early literature exercises,

Reading Movement.

etc. This reading movement assumes that books contain something worth knowing; that the intelligent reading of good books is a source of wisdom and culture.

Moreover, it is conceded by intelligent educators that one of the very important functions of school training is to give pupils the ability and the desire to read thoughtful books. Reading is the key that unlocks the recorded thought, acquisitions, and experience of the race. "Reading," says Lowell, "is the key which admits us to the whole world of thought and fancy and imagination, to the company of saint and sage, of the wisest and wittiest at their wisest and wittiest moments. It enables us to see with the keenest eyes, to hear with the finest ears, and to listen to the sweetest voices of all time."

Reading the Key.

But the ability to read the printed page does not come "by natur." It is acquired by practice, just as every other art is acquired. The ability "to pick thought out of its verbal husk," as Dr. Woolsey, of Yale, once defined reading power, is trained *by husking thought*, and in no other way. The power to read books is not acquired by flitting from page to page, skimming for information or entertainment, and skipping all passages that require earnest thought. In a masterly address at Asbury Park, in 1894, on "The Study of Literature," Professor Moulton, of the Chicago University, stated that the weakness of his students in literature is "not that they are deficient in taste or judgment, but simply that *they have not the power to read*," and, for the reason, that "they have dissipated this power by skimming newspapers and magazines," and, as he might have added, by skimming books.

Husking Thought.

The aim of book study and reading is the same, to wit, *to husk the author's thought.* Study is simply more intensive than reading, a more earnest and persistent effort to get the author's meaning; but reading that fails to do this is not reading in any true sense. It is through the study of books that the pupil comes into the power to master books, and hence book study has a very important place in school training. The chief value of the writer's school and college training resulted largely from the opportunity thus afforded him *to attack and master books*, books that required earnest and thoughtful study. He regrets that this was not supplemented more by the study of things and phenomena, especially in the natural sciences, but nothing could be a substitute for those years of book mastery. The decline in book study has been attended with a marked neglect and slight of books. "For many years," says Dr. T. C. Mendenhall, "I have been in the habit of asking young men concerning the text-books which they had used in the high school or academy. Not one in ten has been able to tell me the names of the authors of these books."[1]

Aim of Book Study.

What is needed in American schools is not the non-use of text-books, but *their proper use;* and this involves a rational union of instruction and book study, the latter increasing as pupils advance in the course. This union is one of the important problems in American education, a problem that can not be met by gush over the so-called German method of oral teaching — a method dependent on peculiar German conditions, and one that is not wholly satis-

Union of Instruction and Book Study.

[1] Proceedings of N. E. A., 1899, p. 367.

factory even in Germany.[1] It is the duty as well as the privilege of American teachers to develop and perfect an American method of teaching, one adapted to American conditions and vitally meeting American needs.

Memoriter Methods.

The objections to the use of text-books are usually based on the assumption that such use necessarily involves the committing of the text to memory. Indeed, it is common to characterize the text-book method as the memoriter method of teaching. It is now over fifty years since Horace Mann, Henry Barnard, Calvin E. Stowe, David P. Page, and other early leaders in American education, called attention to the weakness of the memoriter method, and urged a more rational method of teaching. If our observations are trustworthy, the memorizing of text-books has a small place in our best schools. Indeed, there is reason to fear that in many schools the memory now receives too little attention. There are definitions and principles in nearly every branch which, when understood, should find a sure place in the memory. Literature abounds in gems of thought and sentiment which, treasured in the memory, enrich the life. Nor can it be asserted as a principle of teaching, that nothing is to be memorized which is not perfectly understood. There is a little perfect understanding of truth by the young. Every intelligent person has carried in his memory statements of truth, as verses of Scripture, which only the experiences of life have made plain.

[1] In a review of Dr. Seeley's "German Common School System," Dr. FREDERICK PAULSEN, of the University of Berlin, concedes that while the method has great advantages, it has serious disadvantages. The child learns too little to help himself, and depends too much on the teacher. As a result, when he leaves school in most cases his intellectual culture ceases. He is too little accustomed to help himself out of books.

Moreover, it is a mistake to suppose that the memoriter method is confined to the use of text-books. We have seen in recent years more memoriter work in classes *not* using a text-book than in classes using a book, and certainly with less reason. It is common to see definitions, principles, and even rules written upon the blackboard, and then copied by pupils and learned by heart. These copied statements, if original, are seldom so good as those found in standard text-books, and are often much inferior to them. In some schools the class books thus filled by the pupils are really skeleton text-books, with little merit.

Memoriter Work.

Proper Use of Text-books.

The use of a book the first three years of school is chiefly limited to reading, including spelling; and reading may be so taught during these years as to give pupils considerable power in the mastery of the printed page. Indeed, reading should initiate the habit of book study, but to this end, the reading lesson must be made an effective training in *thought reading*. The pupils must be taught the concepts and ideas which words express, and then be led to a clear grasp of the thought expressed by words. All true reading is thought reading, as shown in a subsequent chapter (XVI.).

Use in Reading.

The teaching of number presents the next opportunity for the use of a book, and this may be improved to advantage as early as the third school year. The elementary arithmetic stands next to the reader as a means of training children in thought reading, and especially is this true when it contains numerous simple

Use in Number.

problems for study, grasp, and solution. There is no more effective training for a child in thought reading than the grasp of the simple relations between concrete numbers expressed in language. The printed manual has several important advantages over number exercises written on the board (Chap. XX.).

Use in Other Branches.

In the fourth or fifth school year, an elementary manual of geography may properly be added to those in reading and arithmetic. There is no book better suited for pupils of this age than a good elementary geography. The oral lessons of the previous years have given the pupils a clear knowledge of many primary facts, and the test is accompanied with maps and illustrations which greatly assist in its mastery. No elementary branch permits a more complete and satisfactory union of oral teaching and book study during this intermediate period. In the last three years of the grammar school course, the study of physiology and hygiene, United States history, and English gram mar (last two years) afford increasing opportunities for the study of books.

It is thus seen, without going more into details, that even an elementary course of study affords opportunities for the union of oral instruction and book study, with increasing power on the part of the pupils to master the printed page. This leads to the question, How can oral teaching and book study be so united during these years as to give pupils, not only clear knowledge, but effective training in book mastery, in husking thought? This suggests a preliminary inquiry as to the nature of oral instruction when based on a text-book.

INSTRUCTION BASED ON THE TEXT-BOOK.

The first suggestion is that such instruction must have a close relation to book study by the pupils. If the several subjects are taught independently of the text-book, the necessity for study will be removed, and the use of the book, if one is used, will be apart from its chief purpose, to wit: the training of the power to acquire knowledge from books. This power can be trained only by successful book study and mastery. It follows that the chief purpose of oral instruction when based on a book lesson, is *to prepare the pupil for the intelligent study of the text.* In other words, in the desired union of oral instruction and book study the former must be made *preparatory to the latter.* This means that the necessity for study is not to be obviated by the instruction, but rather that success in study is thus to be made possible.

Its Chief Purpose.

When book lessons are assigned, instruction should be given only when needed and only to the extent needed. This excludes the teaching of the lesson exhaustively and without reference to the author's treatment. It is feared that oral instruction often breaks down study by removing all necessity for the pupil's effort to know the author's meaning. This is not the *union* of instruction and study, but the substitution of instruction for study, the subversion of the book's function.

When to be given.

It is evident that the nature and extent of preparatory instruction will depend not only on the age and ability of the pupils, but on the nature of the subject and the character of the text-book used. In arithmetic the definitions, principles, and rules are

Its Nature and Extent.

reached by inductive generalization, and the examples and problems in the book may afford the necessary data for the pupil to make these generalizations. The only instruction needed is indirect, there being no necessity to tell pupils anything directly. The same is true in English grammar. The facts and laws of language are best reached by the study of language. The relations of words in the sentence are, for example, learned by the study of sentences. The method is objective, language itself being the object presented and studied. The material for this study may be quite fully presented in the text-book, and comparatively little preparatory instruction may be required. On the contrary the book may treat each subject in a logical order, beginning with definitions, and much instruction may be necessary to prepare pupils for successful study. Few pupils mastered without preparatory instruction the old-time text-books on English grammar.

Information Studies.

But in such information studies as physiology and hygiene and history, it is possible for pupils to master the book with less preparatory instruction. It is true that the author may not present all the facts which the pupils should learn, and the order in which facts or events are presented may not be in accordance with the teacher's views, but nothing is gained by "throwing the book out of the window." This will deprive the pupil of the opportunity to acquire book power, the ability to master books. It is to be kept in mind that knowledge is not the only end in view in teaching, but, what may be more important, *the training of the pupil's power to acquire knowledge from books.*

Important End.

This leads us back to the suggestion that, when books

are studied, *over instruction is to be avoided.* As already stated, it is possible to teach a subject so fully as to remove all necessity for book study. This error is often seen in visiting high schools and even colleges. We were recently present at an exercise in civics in an eastern high school. The teacher talked on the subject under consideration during the entire lesson period. Not a question was asked, not a pupil said a word; and, so far as we observed, not a note was taken. In another high school an exercise in physiology was witnessed. The teacher developed the lesson mainly as it was presented in the book in the hands of the pupils, and this was done without testing in any way the pupils' knowledge of the subject. In reply to a question after the dismissal of the class, the teacher stated that she felt obliged to teach the lesson thus because of the inability of the pupils to study. She added that it took most of the first year to teach the pupils to study a book lesson. The surprise was that they learned to study even in one year under such instruction.

Over Instruction.

Examples.

But high school teachers are not in this fault sinners above all men who fill the teaching office. Some years ago, when in an official position, we witnessed a recitation in analytics in an Ohio college. The professor developed the lesson on the board fully, and, it may be added, thoroughly, his effort being a very faithful reproduction of the author's treatment in the book in the hands of the students. Not a question was asked that could not be answered by yes or no, or even without vocal effort by a nod or shake of the head. The exercise closed, and we were about to enter another room, when we were stopped by two students with this

A College Example.

question, "Beg pardon, Mr. White. How did you like our lesson?" This was a poser, as we did not wish to say a word that would be disparaging to the professor. Our wits came to us and we answered in the most indifferent manner, "The professor recited admirably!"

These illustrations suffice to show the kind of work that is likely to be done by teachers who accept the throw-the-book-out-the-window injunction as sound pedagogic wisdom. When subjects are thus taught, it is idle formally to assign lessons from books. The most superficial study, if any, is sure to be the result.

This leads to the suggestion that all needed preparatory instruction may often be given in *the assignment of the lesson*, this being specially true in higher grades. Few teachers realize how fine a test of teaching ability and success is the manner in which lessons, and especially book lessons, are assigned. A very good judgment of a teacher's work may often be based on this simple test. "Take the next chapter; class dismissed," is sufficient ground for dismissing a teacher from further consideration if one is looking for a first-class instructor.

Assignment of Lessons.

A lesson for study should be assigned in a definite and suggestive manner. The work to be done by the pupils should be clearly indicated, and needed help given. Sometimes this assistance may be a simple reference to a subject previously studied; in another case it may send the pupils to another book, this being often true in biography or history. Time spent in the proper assignment of a lesson saves time, not only in study, but in the teaching of the lesson. There is no such help to success in study as the definite, suggestive, and inspiring assignment of the lesson.

But it is not enough that lessons be properly assigned. It is equally important that *the teacher be faithful to such assignment in the recitation.* A recitation that secures thorough preparation always has a good memory. The teacher who forgets or, for other reasons, fails to test the preparation of his pupils in the directions indicated in the assignment of the lesson will not long secure faithful study. If there be a probability that their work will not be tested, most pupils will take the chance and neglect study.

Fidelity to Assignment.

The writer holds in pleasant memory a teaching exercise that most happily illustrates the foregoing principles and suggestions. It was the skillful work of a teacher of history in a city high school in Ohio; and is best described in the language of a visitor to the school, as follows:

Model Example.

"The day I visited the class room of this famous teacher of history, the lesson was the reign of Henry VII. The recitation was nearly concluded when I entered, but the work which I witnessed was in every way most admirable. Ten minutes before the close of the period, the teacher entered upon the assignment of the next lesson, which was on the reign of Henry VIII. (first half). She skillfully analyzed the reign, giving the important topics to be studied; indicated what was most important to know under each topic, and for additional information, referred the pupils to several other histories in the public library, giving page and often paragraph. All this was noted by the pupils whose facile pencils followed the assignment. Thus in eight minutes she had put before the pupils clearly and definitely with needed guidance the work which she expected them to do, and they were evidently deeply interested in the lesson.

"At the close of the session I was in the public library (fortunately in the same building), chatting with the librarian, who was an old friend, when the door opened, and in came the high school class in history, with note books in hand. 'You must excuse me now,' said the librarian, 'there comes Miss A——'s class. That woman

gives me more trouble than all the other teachers in the city; but I like it. She is a great teacher.' He took from the shelves the histories called for, and they were taken to the study tables. He looked over the pupils' notes, and then took down other histories (he was a historian) and placed them, opened to the right page, on the tables. Forty minutes were spent by the pupils in this study, and they left with helpful notes.

"I returned the next day to witness the recitation. I need not say that it was admirable from start to finish. The teacher did not give a lecture or talk on the reign of Henry VIII. She had sent her pupils to books for information, and now they 'had the floor.' They told well what they knew on the topics outlined, showing that they had read books to some purpose. The recitation was full of interest and enthusiasm. It closed in time for the assignment of the next lesson."

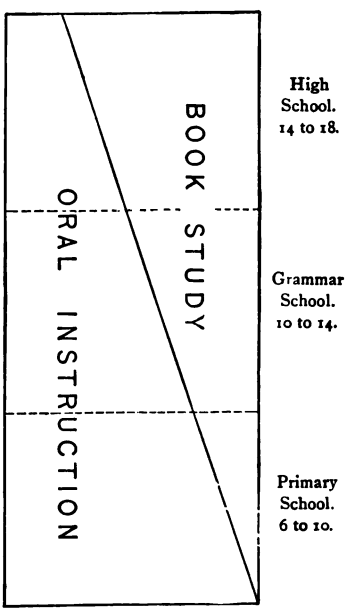
Possibly some reader may be objecting that such ideal work is possible only in a highly favored school. "What," he may be asking, "can teachers do who have no public library at hand?" They can certainly do a similar work. Is there a teacher of United States history, in even a rural school, that cannot have two or three histories on his table? There are few neighborhoods in which one or two histories could not be borrowed for such a purpose. Of course, such work requires preparation on the teacher's part. He cannot thus use books if he does not read them; does not know what assistance they can afford his pupils. It is evident that pupils thus taught are acquiring the ability to get knowledge from books.

Objection.

It is seen from the foregoing discussion that there are two errors which should be avoided in the use of text-books. These are (1) the requiring of pupils to master book lessons for which they have not been properly prepared, and (2) the removal of the necessity of study by too much instruction. It is easy

Two Errors.

to make either of these mistakes. The general principle to be observed when books are studied is that assistance should be given to pupils *only when it is needed.* It is a mistake to give such instruction in advance as will deprive pupils of the benefit and joy of mastering difficulties by their own efforts; and this is true whether mental training or knowledge be the end sought. Every experienced teacher usually knows in advance what instruction, if any, is needed; and instead of leaving his pupils to sure defeat, he will throw needed light upon anticipated difficulties, and thus enable his pupils to overcome them with the feeling that the victory is their own. It is one thing to solve a problem for a pupil and thus rob him of the sense of victory, and quite another to assist him to solve it.



It may be added that the instruction needed by pupils as a preparation for successful study grows less as they advance in the course, and, as a result, acquire increasing power to master books. A like relation holds between oral instruction and book study in school training. As the one decreases the other increases, as shown in the graphic illustration above.

Enough has been said to make evident the importance of pupils' acquiring in school the art of study, and increasingly the art of book study. The unchallenged charge that the pupils promoted to high schools do not, as a class, know how to study is a pretty serious indictment of the grammar school. Teachers who have had twenty or more years' experience in high schools agree that pupils now admitted to the high school cannot attack and master a book lesson so well as the pupils who were admitted twenty years ago; and this decline in book power is generally attributed to the absence of needed book study in the grammar schools. It may be a question whether this result is not due in part to the large number of teachers under whose training pupils now pass in reaching the high school, teachers with varying ideals and skill, some undoing the good work done by others. The colleges repeat this complaint against the high school and academy, though, perhaps, not so unanimously or strongly.

Neglect of Study.

In seeking a remedy for this alleged decline in book power, it is helpful to see at the outset that the art of study cannot be formally taught to pupils. It is rather an art that is learned only by its intelligent exercise. Both the art and the habit of study are acquired by actual study under helpful conditions and stimulus. They are developed *in* the pupil by his own activity and effort, largely in meeting school requirements. The searching recitation is both the occasioner of study and the test of its results. Indeed, the character and the degree of the pupil's study are largely determined by the manner in which lessons are assigned, and the character of the subsequent recitation. The study of pupils as a class never rises higher than the

Art of Study cannot be taught.

teacher's tests. It is what is required and done that tells, not what is talked about and advised. The teacher must see that pupils study in the right way, and the recitation must make this right way a necessity.

Another observation seems important. The success of the pupil's study depends largely on his forming clear and precise ideas, and these at first necessarily lie in a narrow field. The wider the ground covered in elementary study the more indistinct and vague will be the knowledge acquired. In acquiring the art of study there is great advantage in first learning a few things thoroughly. The pupil must know the elements of a subject before he is prepared for a discursive and wide survey of it. The process of widening one's knowledge always involves the possession of some definite knowledge to widen.

First Study of Subjects Narrow.

There is much practical wisdom in Alexander Bain's suggestion that in its early stages instruction should be narrow and thorough, narrow in order that it may be thorough. Discursive and wide instruction comes later. Dr. Bain goes so far as to urge that one good text-book is sufficient while the elements of a branch are being learned; this to be mastered before others are taken up. It goes without saying that these suggestions are not in harmony with the present trend in school training.

Dr. Bain's Suggestions.

The criticism is increasing in volume that too much is now attempted in grammar and high schools, not simply too many studies, but too wide and hence superficial treatment of each. It looks as if the so-called "enriching of the course of study" may be crowding *study* out of the course.

A Criticism.

CHAPTER XI.

CLASS INSTRUCTION.

In the preceding pages, the art of teaching has been considered without reference to the number of pupils taught, and the principles reached apply equally to the teaching of one or several pupils in a given exercise. But it does not require a very wide experience or observation to discover that it demands different as well as higher skill to teach twenty pupils in a class than is necessary to teach a single pupil; and this is true whether the exercise be one of instruction or drilling or testing.

Number of Pupils.

The difficulty involved in teaching pupils in classes increases with the number of pupils taught. While there may be many teachers who can teach three or four pupils about as well as one, there are comparatively few persons who can teach large classes successfully. Indeed, the skill required to teach forty pupils in a class may be more than double the skill required to teach twenty pupils. Educators of experience usually give twenty pupils as the maximum number for satisfactory class work by the average teacher. But it is evident that this maximum will vary with the nature of the exercise, the grade of the pupils, and especially with the skill of the teacher. In certain exercises the most skillful teachers may do good work with as many as forty pupils. In most studies a ma-

jority of elementary teachers cannot do their best work with more than ten pupils in a class, for the good reason that they have never studied or intelligently practiced *the art of class teaching.*

Before any attempt is made to study this art it seems important to determine whether pupils in school should ever be taught in classes. It seems hardly worth while to study an art that should never be used. It is clear that the doctrine of *individualism* in school training, when carried to its logical conclusion, denies both the desirability and the possibility of class instruction. It asserts that school training should be guided at every step by the capabilities, interests, desires, and needs of pupils *as individuals;* and then it assumes confidently that the individual endowments and needs of pupils are so unlike and varying that it is not possible to teach them successfully in classes. It asserts that no two children have powers, interests, desires, or tastes in common, and hence that each child must be studied and trained by himself. It is but a short step to the conclusion that "It is little less than a crime to attempt to teach pupils in classes"; that the imperative need of every child is individual instruction and training.

Individualism.

It is evident that this view destroys the school, except the school of a very primitive type. It is not possible to base class instruction on the individual characteristics of pupils. The modern school assumes that children are endowed with common powers, and that they face common interests and needs, those of the common civilization into which they are born. The school also assumes that the training which best fits children for the duties and obligations of life is based primarily on their common powers,

Assumption of the Modern School.

interests, and needs, and hence that this training is best given to pupils in groups or classes. The prime reason for class teaching is not its economy, although this is an important principle, but its efficiency as a means of preparation for both individual and social life.

Assumptions verified.

The foregoing assumptions of the school have been fully verified by an experience that has shown it to be one of the most vital institutions of modern civilization. Generation after generation of youth have thus been trained for high service and usefulness. Take out of our civilization what the school with its courses of training has put into it, and the change would be as sad as marked. What diversity of power and interest, what specializations in activity and enterprise have come out of the common discipline of the American school and college! Nor will it suffice to claim that all this marvelous diversity and specialization in effort exist in spite of the class training of the school and college. The facts do not warrant the claim. The most that can be asserted with reason is that greater adaptation in school and college training to individual interests and needs would have increased this diversity of power and effort.

Individual Power of Appropriation.

This extreme theory of individualism in school training overlooks the fact that different pupils are each endowed with special power to appropriate and assimilate from common elements and like conditions *what their individual natures need for nurture and growth.* There is nothing in the nature of the child more individual than this power *of selection and appropriation.* This principle has an illustration in the characteristic physical growth of children fed at a common table and subject to like family

conditions. Nor is the force of this illustration lessened when the diet is too limited in kinds of food to permit any play of taste or appetite except in the quantity of food eaten. The individual variations in physical development seem to be as great when food is limited in kinds as when there are many kinds of food provided. The deeper physiological fact is the power of the physical organism to appropriate from given elements what is needed for individual growth and activity.

This same principle of individual appropriation and assimilation holds in psychical nurture and growth. Just as the bodies of children are nourished from common food and drink, each according to its own nature and need, so their souls may be nourished by common instruction and training, each appropriating according to its individual bent and nature. It is here that the law of self-activity has its finest illustration. No two pupils get precisely the same activity and nurture out of a class exercise. Individual interest and inclination are marvelously keen eyed and quick in self-nurture.

A Parallel.

It is conceded that too much emphasis has been placed in school training on what is common and typical in pupils, and that too little attention has been given to what is characteristic and individual. But in correcting this error great care should be taken to avoid the other extreme. What is needed is not the abandonment of the class system but higher skill in teaching pupils in classes, — a skill that is sufficiently keen eyed to note individual characteristics while training common powers.

Correction needed.

Most of the objections to class instruction urged by the advocates of individual teaching are based on poor

class work, the pupils being described as inattentive and listless, and the exercise as destitute of interest and power. It is to be regretted that this is a true picture of too many class exercises, but the failure is due *to a lack of skill in teachers*. It is not a necessary result of class teaching. On the contrary, in a skillful class exercise every pupil is alert and active from the beginning to the close. The pupil reciting only expresses what the other pupils are doing mentally or are critically considering.

Objections to Class Instruction.

In an ideal class exercise this common activity is *necessitated* by the teacher, and this is an essential element in the art of class teaching. Nor is this skillful "handling" of a class possible to only a few specially gifted teachers. It is an art that every capable teacher may acquire, an art that has been acquired by many hundreds of earnest teachers. It involves, in addition to the use of right methods, skill in arousing the interest and holding the attention of pupils; and this involves such a skillful presentation of subject-matter as will necessitate the attention and activity of the entire class. The same questions or the same topics may be used in class teaching as would be used in individual teaching, but in the former the questions or topics must be so put before the class as to necessitate the attention and thought of every pupil. It is not possible to give even the essential elements of a skillful class exercise in a brief description here. It must suffice to add that class teaching reaches its ideal only when all the pupils are attentive and active from start to finish.

Ideal Class Exercise.

A skillful class exercise will necessarily disclose differences in the capacity and attainments of the pupils;

and, if the exercise be one of instruction or drill, these individual variations may readily receive needed attention. It is true that this adaptation of a class exercise to individual needs will require on the teacher's part quickness of discernment and tact in action, but these are important elements of the teaching art. In a sense all the pupils of the class must be in the eye of the teacher and each an open book. Only right experience in teaching can develop this power. As the reading of the printed page involves a double action, one of the eye, which takes in words in groups and sentences, and the other of the mind, the reading of the thought, so skillful class teaching involves attention in two directions, one to the class as a unit, the other to the individual pupils.

Individual Differences.

Since all teaching is the occasioning of right activity in the learner, it follows that class teaching involves the activity of individual pupils and is in a true sense individual teaching. The only possible exception is an exercise in which the activity of the pupils is automatic and mechanical. There is no ground for the assumption that only instruction limited to a single pupil occasions individual activity and learning. It is possible for twenty pupils in a class to receive each as much training from a common course of instruction as would be received were each pupil taught the same studies alone; and this is possible, though the instruction of the class may not in *all* its details be so well adapted to individual need as would be true in teaching a single pupil, what is loss in this direction being more than made good by gains in other directions. We are thus led to a consideration of the advantages of class teaching.

Class Instruction Individual.

Merits and Advantages of Class Teaching.

Class teaching has important advantages, and this is true whether the exercise be a lesson or a recitation.[1]

Advantages. In class instruction, whatever be the method, each pupil is benefited by the participation of other pupils. His view is corrected or widened by theirs, and from their point of view he gains new insights and fuller knowledge. Their grasp of what is taught quickens his mental activity, and their success stimulates him to greater effort. The mental alertness of a group of pupils under stimulating instruction is a matter of common observation. The same is evident in a skillfully conducted drill. A glowing enthusiasm pervades the class. The successful effort of one becomes an inspiring example for the others, and all come into the helpful spirit of coöperative effort.[2] Indeed, the pupils in a class exercise often learn from each other as much as they learn from the teacher.

Preparation for Life. Moreover, the coöperation of pupils in class work is an excellent preparation for real life. It begets the feeling of social coöperation, awakening a desire to do what others are doing, and the

[1] "The class system is really one of the greatest inventions ever made in pedagogy. A class recitation is a great means of instruction; far more potent than any device of individual instruction. The ideal of instruction is not the private tutor with his single pupil." — Dr. W. T. Harris, Proceedings of N. E. A., 1895, p. 407.

[2] The wise teacher finds large advantage in group teaching. The many-sided friction is a good thing for the child. Class exercises are a tremendous impulse in forwarding individual children. Individualism tends to a loss of the advantage of the spirit of coöperative effort. Class work reënforces each by the understanding of all others." — Dr. Richard G. Boone, Proceedings of N. E. A., 1895, p. 407.

ambition to do well whatever is attempted. The pupil learns to measure himself by others, and the stimulus to effort is increased by the fact that he is doing like work under like conditions. He also loses in good degree the fear of criticism, and thus gains the power of confident effort in the presence of others. It is helpful to realize early that others also make mistakes and come short in effort. It is evident that all this discipline makes for success in the practical duties of life.

Abuses of Class System.

The advantages of the class system are not disproved or met by citing its well-known abuses, such as the chaining of pupils of unequal attainments together from term to term; the ignoring of individual attainments and needs in class work; the gauging of requirements by the standard of the average pupil; the sacrifice of the individual to the demands of uniformity and system, etc. These and other abuses of the class system certainly need correction, but happily this does not require the abandonment of class teaching. Here the correction of abuses does not involve the abolition of uses. What is needed is class teaching that skillfully meets individual ability and needs.

Individualism and the School.

It has been asserted (p. 133) that the adoption of the plan of teaching pupils in all branches separately as individuals would destroy the modern school. It is not meant that no sort of a school is possible with individual instruction. It is, of course, possible to place a few pupils under a teacher who directs in a general way their activities, and gives to each such personal attention as may be feasible. The writer once attended a private school of twelve pupils who formed over thirty so-called classes, and he alone formed four and, for a part of the term, five of

these classes. More than half of all the exercises in that school were individual, that is, with a single pupil. It was not possible for the teacher to do more than "hear" lessons recited, or glance at work done and assign more. There was little time for instruction. It was necessarily a poor school, and most of the pupils made very little progress.

Individual Instruction in Rural Schools.

There are thousands of rural schools in the United States with less than twelve pupils in daily attendance, and while few of these schools teach so many branches as the private school referred to above, the pupils are so unequal in capacity and attainment that group instruction is not practicable in all lessons. Much of the teaching is necessarily individual, even with the best possible classification.[1] The experience of these rural schools shows that the best work is done when several pupils can be grouped and taught together. The improvement of the rural school has been largely effected by a better classification.

Individual Instruction in City Schools.

In cities and towns where hundreds of pupils are massed in the same building, both imperative economy and needed efficiency require the grading of the pupils and their instruction in classes. The writer is aware that it is claimed by the advocates of individualism as the basis of the school that the feasibility of individual teaching even in large schools has been demonstrated by actual experiment; but there has been no trial of the plan which did not play fast and loose with the principle of individualism. It is confidently asserted that no *real* trial of individual teaching in large schools has been satisfactory except

[1] For a full discussion of this subject see "The Country School Problem" by the author, published by the American Book Company, New York.

to those who were responsible for the experiment. Most of the so-called trials have been a mixture of individual and class teaching, class teaching being simply supplemented by more or less separate individual instruction. There is in every elementary school a place for individual assistance and work, but the conditions that make such special individual attention necessary diminish as pupils pass up in the grades.

It is true that in an ideal class the pupils are supposed to be of equal ability and attainments, a condition that is found in few, if any, classes. Even when pupils are of nearly equal attainments at the beginning of a term, they soon work apart more or less. This unequal progress may be due to unequal ability, to varying aptitudes for the given study, to differences in physical vigor, to unequal home advantages, to absence, etc. This unequal progress necessitates reclassifications, and it is just here that some of the most serious difficulties in the class system appear, it being usually necessary to reclassify pupils without increasing the number of classes.

Unequal Progress of Pupils.

Fortunately, the necessity of like attainments by the pupils in a class varies much with the nature of the studies. In the more scientific and logical studies, such as English grammar, arithmetic, and algebra, low attainments in the more elementary topics and processes make the mastery of the more advanced very difficult; but in several of the school arts, as reading, spelling, writing, drawing, and language, equality of attainment is less important. Experience shows that pupils who may be a year apart in skill in any one of these arts may be successfully taught together. It is possible to make class instruction even

Degrees of Equality.

under such conditions very helpful to the pupils, much more helpful than is possible when a school is broken into fragments of classes with little or no training. It goes without saying that the more unequal the ability and attainments of pupils in a class, the larger must be the element of individual attention and the higher the teacher's skill.

Graded School Problems.

It is freely conceded that the grading and classifying of pupils even in city schools are beset with serious difficulties. Nor are these difficulties fully met by the frequent reclassification of pupils by promoting the more advanced pupils in a class, and uniting them with the more backward pupils in the next higher class. It is easy to make a strong indictment of the graded system as it was formerly administered in many cities and towns. The perfection and running of the system as such have often so absorbed interest that the fact has been overlooked that *the system is for the pupils*, and not the pupils for the system. The graded system with its demands for uniformity has often been a Moloch appeased only by the sacrifice of the aptitudes, needs, and interests of pupils as individuals. But the problems of the graded school are receiving most earnest attention, and in the past few years encouraging progress has been made in their practical solution. It is increasingly seen that the graded system is not an end of school administration, but only a means to an end, that end the best possible education of youth.

CHAPTER XII.

TEACHING PUPILS IN CLASSES.

MUCH that is said in Chapter VIII. on the testing of pupils applies equally to the other teaching processes. There is not only a question method of testing, but also a question method of instruction, each requiring careful study and practice.

It is helpful to see that in teaching, questions have two distinct uses, to wit: instruction and testing, and hence that they have two somewhat distinct forms which are characterized by the terms *teaching* questions and *test* questions, the term teaching being here used in the sense of instruction. **Teaching and Testing Questions.** In instruction the aim of questions is to direct the pupil's observations in the study of objects or to guide his thinking in the study of subjects. Whatever the aim the questions used in instruction should have all the qualities essential to good test questions; that is, they should be clear, concise, and definite, and, in addition, they should have a proper sequence, always essential in instruction, but not so important in testing. The essential thing in a test exercise is that the questions test what is vital and fundamental, this being specially true of written tests. In the oral test or recitation it is also important that the questions or topics present a systematic unfolding of the subject, as previously shown

(p. 107). The recitation thus conducted serves a double purpose, a testing and also a clarifying of the pupil's knowledge. In instruction this orderly sequence is not only important, but *essential.*

It is not, however, important for our present purpose to make special note of the distinction between instruction questions and test questions, or even between lessons and recitations. The difficulties involved in the teaching of pupils in classes lie more in the *distribution* of the questions or topics than in the questions or topics themselves. Indeed, the questions or topics to be used in teaching a subject have little reference to the number of pupils taught. They are practically the same whether there be one or many pupils. The essential thing in class teaching is the skillful designation of the pupils who successively lead in the study of an object or subject. As thus stated this may seem a very simple, and, possibly, an unimportant matter, but just here is the cause of the failure of many class exercises. In successful class teaching the pupils who recite are so designated as *to necessitate the undivided attention of the entire class, the mental activity of every pupil.* Whether the exercise be a lesson or a recitation, it must be so conducted as to secure these results.

Distribution of Questions.

Methods of Calling on Pupils.

There are three quite distinct methods of calling on pupils to respond to questions or topics in a class exercise. In the first, called the *consecutive* method, the pupils recite in consecutive order or "by turn"; in the second, called the *promiscuous* method, the pupils who recite are designated promiscu-

Three Methods.

ously by the teacher; and in the third, called the *simultaneous* or *concert* method, the pupils recite simultaneously or "in concert." Let us study each of these methods to learn its advantages and defects, and also its proper use in class work. It will not be necessary in this study to limit the method under consideration to a given teaching process or to a given class exercise. Practically the principles to be observed in calling on pupils in a recitation will apply with slight modification to a lesson, and *vice versa*.[1]

1. The Consecutive Method.

This is probably the earliest and most widely used of the methods named. It is still the prevailing method in many schools. Nor is this early and wide use of the method wholly without reason. It has several obvious advantages which commend it to the favor of teachers, and especially to those who have never carefully considered its defects.

Its Advantages.

The first of these advantages noted is *rapidity*. The reasons are obvious. The special designation of the pupils to recite takes some time and there is more or less hesitation in the response; but when pupils recite in turn little time is lost. The pupils know when they are to recite and are ready to respond promptly. The time to recite is a certainty and the pupils are alert. Experience shows that more questions can be asked and answered in a given time by the consecutive method than is possible when the pupils to recite are designated by the teacher.

Rapidity.

[1] In pages 145–151 the author has made free use of his treatment of the same subject in the "Elements of Pedagogy."

Another advantage of the method is the fact that it is *easy for the teacher.* He is relieved of the labor involved in selecting and designating the pupils to recite; and, in test exercises, his labor is thus reduced to asking questions or assigning topics and then determining the correctness of the pupils' answers or responses. The recitation may proceed as regularly and about as mechanically as clock-work. The same is true in drill exercises.

Easy for Teacher.

Another advantage of the turn method is the fact that *all the pupils have an opportunity of reciting.* The pupils respond consecutively and no one is omitted. This is an important advantage in class work and especially in recitations that test the results of study. Few pupils will thoroughly prepare lessons if there is even a probability that they will not be called on to recite. The writer has known classes in which it often happened that most of the pupils did not have an opportunity to recite for several successive days. The result was a loss of interest on the part of the omitted pupils and a resulting neglect of study. The most faithful study is secured when every recitation tests the preparation of every pupil in the class.

All have Opportunity to Recite.

The foregoing advantages of the consecutive method are more than offset by its failure *to necessitate close and universal attention.* The pupil reciting and possibly the one who has the next "turn" must give attention, but the other pupils are not obliged to do so. As soon as a pupil has recited, he can go a-fishing mentally until his turn comes again. It is true that a skillful teacher may so interest his class in the lesson as to secure general attention, but this is not a result of the turn method. Universal attention is

Failure to Necessitate Attention.

secured not in consequence of the method but in spite of it. The failure of the method to secure close attention results in its failure to occasion the continued mental activity of all the pupils, the ideal of a skillful class exercise. Just to the extent that a class exercise fails to occasion the universal activity of the class, just to that extent it fails to meet the needs of the pupils. A true class exercise is a continued mental gymnastic to all the pupils.

Another weakness of the consecutive method, as generally used, is the fact that it permits *a partial preparation of the lesson*, a weakness that appears most commonly in book lessons, but it may exist in other lessons. The pupils near the foot of the class are tempted to neglect the part of the lesson which is to be recited by the pupils near the head, and *vice versa*. In the old-time school the pupils read in turn one "verse" each, and it was a common practice for the pupils to count the verses and then study only the verse which they would read. This practice still exists not only in schools, but even in some colleges which use the turn method. As a rule, pupils will prepare most faithfully that portion of the lesson which they *expect* to recite, and the turn method may permit this expectation. It is true that this partial preparation may be obviated by the teacher's not following the order of the text-book, but this may interfere with the proper unfolding of the subject.

Partial Preparation.

This difficulty may, however, be effectively remedied by having the reciting begin from day to day *at different points in the class*. If the exercise begins with the fifth pupil one day, the tenth pupil the next day, the third pupil the next day, and so on, no pupil

Remedy.

can even guess, when preparing a lesson, what portion of it will fall to him to recite, and so he is safe only when he has prepared the entire lesson. It is surprising that teachers who use the turn method have not more generally seen the efficiency of this simple device in preventing the partial preparation of lessons. The device works best when all the pupils of a class recite daily.

Another weakness of the consecutive method is the fact that *it prevents the most thorough testing of a class*, a weakness that more specially appears in recitations. The tests which by turn fall to the pupils successively may not be those which would best disclose their knowledge of the subject. The revolving exercise may bring to an idle pupil the only question or topic which he can recite, and he may thus be tempted to trust to luck next time, the idle being as a class very easily tempted in this direction. The highest efficiency of a recitation depends largely on a skillful distribution of its tests.

Thorough Testing.

2. The Promiscuous Method.

A study of the promiscuous method of calling on pupils in class exercises shows that its merits and defects are respectively the inverse of those of the consecutive method. It is weak where the consecutive method is strong, and strong where the consecutive method is weak. Its great merit is the fact that *it secures and holds the attention of all the pupils in a class*. It is true that this result depends somewhat on the skill of the teacher, but the method both permits and favors the highest success.

Great Merit.

When skillfully used, the method necessitates close and universal attention. When a question or topic is announced, every pupil in the class is obliged to be on the alert as he may be designated to respond. He must also give close attention to the pupil reciting, since at any moment he may be called upon to correct an error, supply an omission, or take up and complete the recitation. The frequent calling on pupils to complete the recitation of another, taking it up precisely at the right point, is a most effective device for necessitating close attention and the continued mental activity of all the pupils. This may be readily done in exercises in arithmetic, particularly in the oral solution of mental problems, in reading, history, physiology, and other branches. The writer has witnessed many a class exercise which easily held the attention of all the pupils, obliging every one to do mentally the work of the pupils reciting.

Skillful Use.

It is easy to see that this advantage of the promiscuous method may be wholly lost by designating the pupil to recite *before announcing the question or topic*, a practice still too common in schools and colleges. It ought to be evident that the calling on the pupil before the topic is announced relieves all the other pupils in the class from the necessity of giving it attention, while the announcing of the topic *first* brings it home to every pupil. Every one must be ready to take it and, to make this result certain, there should not be even a prior glance at the pupil to be called on to respond.

Mistake in Use.

A class exercise may thus be made a fine mental drill, an excellent mental gymnastic. Suppose, for example, that a class in arithmetic, containing say twenty pupils,

solves twenty problems in an exercise. If the exercise is so conducted that each pupil solves but *one* problem, the exercise will necessitate but *twenty* mental solutions. If the exercise is so conducted as to oblige each pupil in the class to solve mentally all of the twenty problems, it will necessitate *four hundred* mental solutions. The difference in the training value of the two exercises is evident. It is true that the making of a class exercise such as mental drill requires high skill; but this, let us repeat, is a necessary attainment in all successful teaching.

Mental Gymnastic.

The promiscuous method also permits *a proper distribution of questions or topics.* These can be thrown just where they will prove the most effective and do the most good. The idle pupil may be given opportunity to show the consequences of his idleness; the pupil who was assisted yesterday may be called on to recite in review; any lack of attention may be instantly corrected, etc. Indeed, the lesson may be so distributed as not only to keep all pupils alert and active, but also to give each needed opportunity to participate in the exercise, a very important matter.

Proper Distribution of Questions.

But while the promiscuous method *permits* the best possible distribution of class work, it does not *necessitate* such distribution. This depends on the fidelity and skill of the teacher. An intelligent teacher usually knows in advance the pupils who can answer his questions, and this makes possible the fitting of pupils to questions or questions to pupils. The teacher may be assisted in this fitting process by having the pupils who can answer *raise the hand.* There need be very few failures in a class when this bad device is used. In many classes the hand-

Fitting Questions to Pupils.

raisers do nearly all the class work to the detriment of the other pupils. Dull pupils may also be purposely omitted, this being most likely to occur when visitors are present, as in public examinations. The temptation on such occasions to call only on the brightest pupils is too strong for many weak teachers to resist, and for this reason the public exercises in schools are sometimes worse than shams. Nor is this sham work limited to class exercises. It is too common in school exhibits.

Moreover, the unskillful distribution of class work is often due to *habit*. Many teachers unconsciously assign most of the reciting to a few pupils, almost wholly omitting the others, often the very pupils who most need to participate in class work. Easy teachers are quite apt to assign the more difficult questions or topics to the brighter pupils, and the easier to the backward. On the contrary, a severe teacher is liable to fall into the opposite habit of overwhelming the dull and backward with the difficulties of the lesson and most of the reciting.

Unequal Participation.

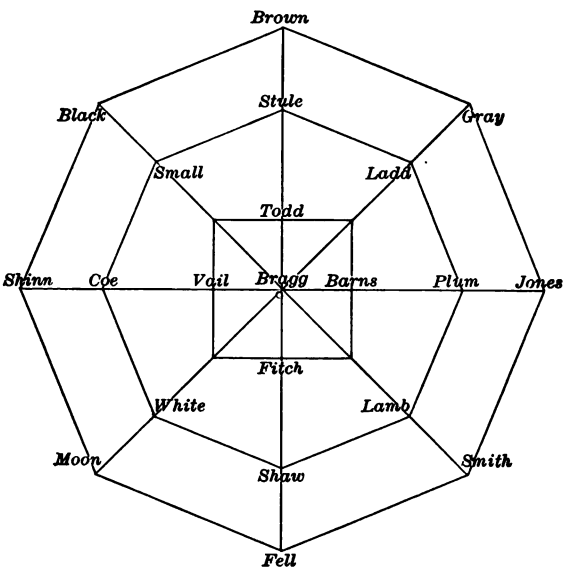
Enough has been said to show that it requires no small degree of skill to conduct a class exercise in such a manner as to secure the close attention of pupils and at the same time to distribute class work properly. While these necessary results can be attained only by insight and skill, teachers may be greatly assisted by the use of proper devices. Indeed, the need of such assistance has been so widely felt that various devices have been invented for that purpose.

Skill Needed.

One of these is to write the name or number of each pupil in the class on a small card, as many cards being used as there are pupils. At each exercise, the cards

are mixed and dropped in a box, or put in a pile on the teacher's table. The pupils to recite are selected by taking cards from the box or pile. The writer obtained this device from Horace Mann. It works very well in advanced classes with long recitations, provided the teacher *frequently* takes a card from those already used, thus holding the attention of those who have recited. It is, however, a poor device for use in class instruction in elementary schools.

Devices.



Another device is to put the names or numbers of the pupils in the class on one card, arranging the same in the form of some geometrical figure, as shown in the diagram above. This, as is seen, will permit the calling of the names or numbers

Geometrical Figure.

on successive days *in different orders*. The writer devised and used this plan years ago with satisfaction. It leaves the teacher free to sit or stand during the exercise, and to occupy different positions in the room. When the exercise closes, the teacher knows what pupils, if any, have been omitted; and, by frequently calling on pupils *without reference to the card*, the attention of the entire class is easily held. In large classes numbers are more convenient than names.

In later practice in college and as an examiner of teachers, the writer has been able to call numbers promiscuously without the use of a card; as 3, 6, 9, 12, 15, 18, etc.; 1, 4, 7, 10, 13, 16, 19, etc.; 2, 5, 8, 11, 14, 17, 20, etc. By frequently calling numbers already called undivided attention is easily held. **Calling by Numbers.**

Since the consecutive and promiscuous methods supplement each other, the easiest plan of avoiding their respective defects is *to combine them*. This may be done by permitting pupils to recite by turn *except* when the teacher designates another pupil. If these exceptions are sufficiently frequent, the attention of the class may be as universally held as by the promiscuous method alone. The most skillful teacher of oral spelling that we have ever known, combined these methods. The words passed rapidly down her class except when she "threw" words pronounced to other pupils, and this was done so frequently and skillfully that no pupil felt safe in taking his eyes from the teacher. When the exercise closed, every pupil had recited, and the poor spellers and the listless had received special attention. This plan may be used in all oral drills, and a little practice will enable any skillful teacher to use it with success. **Union of Methods.**

3. The Simultaneous Method.

The weakness of the simultaneous, or concert, method as a test (p. 100) is also manifest when it is used in a drill exercise or in class instruction. The responses of the class may be led by a few pupils, even by one pupil, and the others may mechanically follow; and all this may be done in such a way as to make it difficult to detect either the leadership or the following, as shown in the chorus test in singing on page 101. Teachers are not only deceived respecting the knowledge and skill of their pupils, but, what is possibly worse, they sadly overestimate their own success in class teaching. They accept the confident and often glib responses of their classes in concert as evidence that the individual pupils actually know what they are saying together. How often are teachers who use the concert method surprised at the disclosures of ignorance made by written tests or by the oral testing of individual pupils. It was this disclosure that exploded the once famous Lancaster system of teaching.

Weakness of Method.

It is not what the teacher says or does in a class exercise that tells, but what the pupils learn; and pupils can learn only by their own activity (p. 33). As already noted, the concert response may sometimes be used with good results in class exercises. It may be occasionally employed to awaken interest and arouse attention; also to fix a truth, and especially its exact statement, in the memory. It may be used in drills in singing, and to a *limited* extent in reading. When a sentence is clearly understood, there may sometimes be an advantage in having a class give vocal expression to the thought in concert. It is sometimes possible to secure a free and clear expression of a

Limited Use.

thought, not otherwise easily secured from some of the pupils. The voices of other pupils not only guide and support the timid and hesitating, but, what is more important, they are thus inspired with confidence, and can do their best, as in the singing of difficult music. But the concert exercise should be very sparingly used even in reading, and it should always be supplemented by the individual drill or test.

Abuse of Method.

But the concert method has been so widely and sadly abused in American schools that it seems wise to discountenance its use altogether. The writer has visited primary schools in which the lessons in reading and spelling, tables of numbers, of weights and measures, etc., were recited not only in concert, but in sing-song, quasi-musical tones, distressing to the ear and stupefying to the mind. There is no speedier way for reducing a bright child to stupidity than a vigorous use of humdrum concert drills. A few years ago a friend who had musical gifts visited the primary schools in one of the largest cities in the country, and indicated the tones used in different concert exercises by a semi-musical notation! It is a pleasure to add that the stupid concert drill is disappearing from American schools. The change in this direction in the last twenty years is very gratifying.

"The Primary Tone."

It seems unnecessary to add that much concert reciting injures the voice, both for speaking and singing. The resulting "primary tone," as it has been called, is still often heard in the pulpit and at the bar, and much of the drilling in reading in the upper grades of school aims to overcome and remove the bad habits acquired in the lower. If concert exercises are ever employed, special pains should be taken

to keep the tones natural and pleasant. The boisterous, discordant yelling, which is encouraged in too many schools as singing, is injurious to the singing voice, and subversive of musical taste. There should be increasing attention given in elementary schools to the quality of children's voices both in reading and singing.

Class Teaching an Art.

It seems proper to add that the teaching of pupils in classes is an art of the highest practical importance in school work, and it should receive special attention in all courses of normal training. It is not enough that young teachers learn the art of developing or presenting subjects. They must also learn the art of distributing subjects and work in such a manner as to meet the conditions of successful class teaching. The class exercises in the normal school should be fit models for the young teacher to study, if not to copy. It is one thing to talk to a school or class, but it is another thing *to teach* a school or class.

Class Teaching in Normal Institutes.

The writer has witnessed class instruction in several normal institutes in the west in which not one fifth of the pupils, and these *teachers*, made any response to questions, even when permitted to answer in concert, for the obvious reason that most of them were not able to give intelligent answers. In several instances text-book lessons had been assigned for study, and the attempt was made to give the exercise the *form* of a recitation, but the result was a nondescript exercise in which several things were attempted and nothing done well. Nor were the instructors wholly without excuse, for the conditions were against them. The teachers in the institute were too crowded with work and their attention too much

dissipated by the social life surrounding them to prepare the lessons assigned. Recitations under such conditions are not practicable, and, so far as teachers under training accept this poor class teaching as a model and repeat it in the schools, such class work is a positive harm. We are fully satisfied that teaching in the schools is lowered in efficiency by the bad examples of class work often found in teachers' institutes, and so-called normal classes. It would be far better for the instructor to develop the subjects taught without any reference to book study, and then by reproductions and reviews fix what is fundamental and important in the memory (p. 113); and in these genuine lessons every member of the institute can be reached and held to close attention and active work. The normal institute should never be lowered to the task of assisting poor scholars to pass examinations for a teacher's certificate.[1]

Bad Influence.

[1] The attempt to make a teachers' institute a school for academic instruction is one extreme in institute management, and the making an institute a place of amusement and social enjoyment with "inspiration" speeches is another extreme. As the writer recently stepped before a teachers' institute to give his second lesson, the young county superintendent whispered to him, "Work in a story or a joke to make them laugh. Teachers like a good laugh." Before the second day closed this superintendent found that his teachers could be deeply interested in thoughtful, clean-cut instruction, dealing practically and helpfully with their duties as teachers. The "joke" business possesses too many institutes. The following outline of a performance on the "Teaching of Arithmetic," recently heard in an institute, is not an extravagant caricature:

Condemn with ridicule prevailing methods and results. Tell a funny story to get up interest. Dip into the "Philosophy of Number." Wake up audience with a laugh-raising joke. Try the pathetic; recite several stanzas of "Little Boy Blue." Touch on teachers' salaries (always practical arithmetic!). Tell how Eugene Field "got a raise" in his salary. Announce continuance of arithmetic in next lesson. Work up a peroration on — anything, ending with a side-splitting joke. Leave platform slowly amid applause.

This poor class teaching is seen in abundance in the schools, not only in elementary schools but also in high schools and colleges. The writer has seen scores of lessons given to a room full of pupils responding in concert, in which only a few of the brightest pupils were really following the leader. The other pupils were mechanically following the bright pupils, repeating after them, so far as they recited at all. It was instruction *fired at a class*, so far as it had an aim, but was not class instruction. Nor is this faulty class work to be charged wholly to the "grade teachers," but superintendents taking the classes from their teachers sometimes make even a worse botch of class handling. There are many experienced teachers who cannot teach a class with success. They can develop and present subjects, it may be, but they cannot put these subjects properly before pupils in a class. Our observations raise the fear that in many schools effective class teaching is a "lost art," if it were ever acquired. There is certainly much very poor class work in schools and also in colleges.

Poor Class Teaching.

It is not claimed that all school exercises should conform to the standards set up in preceding pages. There are occasions in every school when inspiration is more important than instruction; when a vital need of pupils is to get at least a glimpse of fields of knowledge too remote to be definitely surveyed and studied. The interest kindled by such glimpses is carried into exercises which aim at more definite results, and the entire mental life of the school may be thus quickened. Nor is it urged that personal influence and power may be superseded by skill in teaching processes. In all school work the personality of the teacher is a

Inspiration Exercises.

vital factor. But there is no disharmony between personal power and teaching skill. The one does not exclude the other. On the contrary, both are essential to the highest success in teaching. The greater the personal resources of the teacher the better, but they cannot remove the necessity of skill in teaching processes.

CHAPTER XIII.

WRITTEN EXERCISES.

ONE of the marked changes in school training in the past forty years is the wide use of the pencil and pen by pupils. This change has occurred not only in the higher grades of school, but increasingly in elementary schools. Writing in some form now accompanies and largely enters into school training in reading, spelling, language, and nearly all other branches.

The slate and pencil have long been used for the solution of examples and problems in arithmetic and alge-

Pen and Pencil.

bra, and later the slate and pencil have been supplemented by the blackboard and crayon, increasingly in class exercises. The pen was early used in exercises in writing and the pencil in drawing. The memory of teachers runs not back of the practice of learning to write by writing and to draw by drawing.

The movement for a wider use of pen and pencil in school work began in the substitution of written for oral

Written Tests.

tests, this being soon followed by the use of the written method of teaching spelling. The wide use of written tests was due to their obvious advantage in determining the attainments of pupils in large classes, especially their knowledge or rather its formal statement; and also to the assumed importance of some uniform testing as a basis for the classification of pupils. Written examinations as a basis for the promotion and

classification of pupils soon became the almost universal practice in graded schools. This led to written methods of preparing and reciting lessons, especially in large classes, and about the only branch in which it was not used was vocal music, and in some schools there were written examinations in music. It has been increasingly assumed in teaching that American children are *dumb*.

This general use of the pen and pencil in elementary schools naturally resulted in the earlier teaching of writing. At first print was used in the lower grades, but in time this was generally displaced by the use of script from the very beginning. The old-time school assumed that young children have not the physical ability to learn to write a "fine hand," and so the child's first practice was in making "pothooks," these leading to a coarse round hand. It took several school terms to reach an attempt to write an ordinary hand. It was, however, found by trial that even first-year pupils can be trained to write script of ordinary size from the first (What cannot young children be trained to do?), and so the more "progressive" schools put infants to writing "like men and women," and other schools took up the new practice. The skill in writing thus early acquired was soon utilized in many ways in primary instruction, and even formal written exercises were imposed upon pupils in the very lowest grades.

Early Writing.

It is a most interesting fact that physiological research in the department of child study has come to the support of the pothook assumption of the old-time school; and so it appears that on this point the old-time teachers were wiser in their day and generation than the later reformers of primary instruc-

Testimony of Physiology.

tion. Dr. G. Stanley Hall claims to have demonstrated that the ancillary muscles of the hand and fingers used in writing are not sufficiently developed in young children for writing a fine hand, or for fine needlework, and that their nervous systems are injured by too fine work in the kindergarten and primary school.

Then here comes the so-called "philosophy" of vertical writing with strong condemnation of the early use of the slant script, which has so long been the joy of "up-to-date" primary teachers. It is surprising what evils are now charged to slant writing in the schools and what reliefs are promised from the substitution of vertical writing. All this raises the suspicion that the evils of the "writing habit" may not be altogether due to the slant of the letters, and it is not at all certain that vertical writing will afford the desired relief. It is more probable that these evils are due to *too early and too much writing in elementary schools.*

Vertical Writing.

This brings us face to face with what is believed to be a serious evil in the modern school, to wit: *an excessive use of the pen and pencil,* especially in lower elementary schools. It is the opinion of many thoughtful observers that young pupils, especially in the graded schools in cities, spend too much time on written work. On this point intelligent teachers ought not to need the aid of experts in child physiology to see that the amount of pen and pencil work done by their young pupils is a serious tax on the nervous system, and that their cramped and unnatural positions when doing such work interfere with the free action of the lungs and other vital organs. In the regular writing and drawing lessons some attention is usually given to the posture of pupils; but in the written

Excessive Use of Pen and Pencil.

preparation of lessons pupils are left free to follow their inclinations, and all this is much worse in the written work at home, which is often done without sufficient light, sitting on high chairs or low stools, and often without the use of a table. The evils resulting from these unfavorable conditions are greatly aggravated by the time given to such work.

A competent observer need not remain long in some of our primary schools, especially in the afternoon, to note the "fidgety" condition of the pupils preparing written work, and many thoughtful parents are watching with solicitude the home work of their children who sometimes act as if they would "fly to pieces," as a nervous girl once expressed her feeling. The increasing nervousness of school children is a matter of common observation, though few, it may be, suspect that the chief cause is an excessive amount of written work.

Injury to Pupils.

There is certainly no justification for the growing practice of requiring nearly all lessons to be prepared in writing, and the only known reason for this practice is the foolish desire of elementary teachers to imitate university methods. The amount of written work required of young pupils in some schools would tax the nervous energy and endurance of adults. Pupils are required to write out (often in set forms) the analysis of mental problems in arithmetic and sentences in grammar, rules and definitions in both branches, these being often copied from the blackboard, tabulated and outlined descriptions in geography, physiology, history, etc., and all this in addition to language exercises, written work in arithmetic and algebra, spelling, writing, drawing, etc.

Preparing Lessons in Writing.

It is just now the fad in certain schools to require young pupils to prepare in writing at home lessons in primary geography, nature study, etc., and not a few parents are obliged to assist their children in this "original" work.[1] Teachers, as well as pupils, have been obliged to spend hours in hunting for the facts for assigned written lessons, — assigned, as it may be, by the superintendent or principal, and this not only in high schools or upper grammar grades, but also in lower grades. The exercises thus prepared may be read in class or handed to the teacher to be glanced over and "marked," then forgotten, an instance in which the chase is deemed worth more than the game.

Home Lessons.

There is one other use of written work that needs only to be mentioned to be condemned. We refer to the assigning of pencil and pen work, *to keep pupils busy*, a practice less common, it is hoped, than it was a few years ago. It is, of course, admitted that the keeping of pupils busy is an important condition in the easy government of a school, but no competent teacher is obliged to impose work *for this special purpose*. There is an abundance of helpful and profitable employment for pupils in school, and the day may be filled with a round of exercises, each affording pleasurable activity and relief. There is no necessity in a good school for the imposition of mechanical tasks to keep pupils busy.

Keeping Pupils Busy.

[1] A friend of the writer recently assisted his son in preparing a lesson on the Hudson River valley, a subject on which the young lad unaided could obtain very little information. The father was well acquainted with the valley, and the next morning he started his son to school with what he was sure would pass as an unusually good exercise. The little fellow returned at noon broken-hearted, exclaiming: "The teacher said it would not do. *I had no arithmetic in it!* I ought to have ratioed the Hudson and Mississippi valleys and got the *percentage!*"

We are now obliged to consider the question of written work in school at closer quarters; and it may be first asserted positively that the total amount of pencil and pen work required of first year pupils daily (chiefly pencil and crayon) should not exceed sixty minutes in four periods; of second year pupils, eighty minutes in four periods; of third and fourth year pupils, ninety minutes in four periods; of fifth and sixth year pupils, two hours in say three or four periods; and of pupils in upper grades, two or three hours daily, the amount of written work increasing as pupils pass up in the grades. These may be accepted as the *maximum* requirements for written work. Of course much will depend on the character of the written exercises. More time can properly be given to free movements in drawing or the solution of examples in arithmetic than to close pen work. The school program should be so arranged that each written exercise is followed by recess or by an exercise that does not tax the muscles of the fingers.[1] A good program provides for frequent changes in kinds of activity.

Amount of Written Work.

The amount of written work required of pupils in a given branch should have intelligent reference to the amount of such work required in *other* branches. And here is a practical difficulty in what is known as the "departmental" system of teaching. The teacher who devotes his entire time to the teaching of one branch comes naturally to feel that it is *the* branch in the course, and as such has superior claims to the time and effort of pupils. So lessons are assigned with little reference to the demands of other teachers, and, as a result, pupils are overtaxed.

Too much Written Work.

[1] White's "School Management," pp. 86–93.

Recent investigations in several schools have disclosed the fact that pupils were assigned home study by three and four different teachers, and that the aggregate of the work thus assigned was twice what most of the pupils could do well in a reasonable time for home study. Not a few high schools that have only one daily session, this broken by a short lunch recess, provide little or no time in school hours for study, and so all lessons must be prepared at home. Much of the written work made a part of such preparation is necessarily done under very unfavorable conditions. It is evident that the home work of pupils needs more careful supervision. It is certainly not sufficient to turn pupils loose into their homes to do school work there as best they may. When the pupils in a class are taught by several teachers, not only the written work but all other study required by each teacher should have reference to the requirements of the other teachers. The total written work assigned by *all* the teachers should be kept within the total nervous energy usable in such work.

Investigations.

Supervision of Home Work.

The writer is aware that teachers, and sometimes principals and superintendents, often resent any intimation that their pupils are in any respect overtaxed, but no competent physician, who knows the physical condition of a large minority (if not a majority) of the pupils in our grammar and high schools, has any doubt as to the possibility of easily overtaxing their disposable nervous energy. It is the weak minority of pupils in our schools (if a minority), whose health needs to be the special concern of teachers and school supervisors. The strong will usually take care of themselves.

Overtasking of Pupils.

In school training special pains should be taken to provide such a *variety* of work as will afford needed changes of activity. The kind of work done in one exercise should afford relief to the powers taxed in another, and the day's round of work should call into play the various activities of mind and body, and each in due degree. True methods of teaching make this change of activity possible and thus secure the best training, as well as the conserving of physical health. The old-time routine of book study with little manual activity has been properly condemned as an overtasking of the mind in one kind of activity, but there seems to be danger of going to another extreme, and overtasking the nervous system by too early and too continuous manual activity, especially digital activity.

Variety of Work.

Enough has been said to show the necessity of great care in the use of written work in instruction and drill in the lower grades of school. It is true that an important end of these lessons is to train pupils in the clear expression of what they know (p. 30), but oral expression is first in time and first in importance. It is much more important that young pupils be able to tell well what they know than that they be able to write it; and besides the first and necessary step in training in written expression is facility in oral expression (p. 222). During the first four or five years of school training the emphasis should be placed strongly on oral expression.

Oral Expression.

The use of written work in teaching the several branches will receive due attention in later chapters, and so it must suffice here to indicate in a general way what is desirable and feasible. In number exercises there is a place almost from the first for the use of figures and written processes, but it

Feasible Written Work.

is clearly a mistake to require young pupils to write out in words the solution of problems. Allusion has been made to the bad English prevalent in the written solution of mental problems in school exhibits. Such solutions are not good drills in written language, and they are not needed in acquiring skill in the solution of problems. The oral solution is in every way preferable as has been abundantly shown in the teaching of mental arithmetic. All that is needed to secure desired results is skill on the part of teachers in conducting oral exercises.

Spelling.

The writing of the words in drills in spelling is almost essential to accuracy in the practical use of spelling in writing. But it does not follow that the exercises in spelling should be wholly written. Experiments seem to indicate that accuracy in spelling is best attained when the eye, the ear, the hand, and the vocal motors are conjoined in spelling drills. Besides, proper oral spelling is an aid in acquiring the accurate and facile pronunciation of words. The oral drills in spelling with syllabic pronunciation in the old-time school unquestionably assisted the pupils, not only in spelling, but also in acquiring the art of reading, so far at least as the calling of words at sight is reading. There is clearly a proper union of oral and written spelling in elementary schools.

Reproductive Lessons.

In early lessons on plants and animals, geography, etc., there is a place for more or less written work, but care should be taken to keep such work within proper limits. There should be oral responses in developing or presenting lessons, and the essential facts taught should be reproduced by the pupils orally (p. 112). This oral training is very important when pupils are not dumb. Now and then a lesson may

finally be reproduced in writing, but when this is attempted most careful preparation should be made. The pupils must be able to tell what they have learned; all new words should be written on the blackboard, and care should be taken in the use of capitals, etc. The written reproduction of lessons by young pupils should be made not merely a test of knowledge, but also a training in its written expression. If care is not taken in these written exercises, careless habits will be formed, and what is striven for in the regular language exercises will be largely lost. An inspection of the ordinary written work of pupils in the schoolroom, not that specially prepared for the purpose or for a school exhibit, will show that this written work is not superior training in language. Pupils usually aim at only one thing at a time; and their aim in a written exercise should be expression, including the correct use of written forms. What is needed in written work is less quantity and higher quality.

Careless Written Work.

WRITTEN TESTS.

We have had occasion in previous chapters to consider the nature and function of the recitation as a test exercise and to note the more obvious limitations of the written test. It now remains to consider more fully the use of the written test in recitations, a use that may properly increase as we ascend in the grades.

The written test has long been more or less used in recitations in spelling, arithmetic, and algebra, and more recently in recitations in language and other branches, especially in reviews. In classes sufficiently advanced it may be used in the final repro-

Use of Written Tests.

duction of subjects taught, also at the completion of each of the several sub-divisions of branches of study, and at the completion of each branch when the tests used need to be more incisive than comprehensive. Such recurring tests, when used as aids to teaching and study, have special advantages. They give pupils a tangible measure of their attainments and progress, thus stimulating them to sustained effort. They are also helpful to teachers, often disclosing defects in teaching not shown by the ordinary recitation, this being specially true when the questions used are not prepared by the teacher.

These advantages are common to oral and written tests when both are equally searching, but the written test has several advantages over the oral test, particularly in larger classes. The written test is more impartial than the oral, since it gives all pupils the same tests and an equal opportunity to meet them; it discloses more reliably the comparative progress of the different pupils, information of value to the teacher; it reveals more clearly defects in teaching and study, thus assisting in their correction; it emphasizes more strongly the importance of fullness and accuracy in the expression of knowledge; and it reveals more fully than separate language exercises the pupil's ability to write correctly when his attention is more specially directed to the thought or subject-matter.

Advantages of Written Tests.

While the written test has these and other advantages, more specially as a test of knowledge, it has its serious limitations. It cannot be made a universal test of teaching results or even a general test. It does not cover all the studies and disciplines of the school course. It is not an adequate test of power or skill since these results are mainly tested by

Its Limitations.

action or doing (p. 92), as in reading and singing. It wholly fails as a test of the will or the conscience or other moral forces in the life. It has no proof of virtue or character. Indeed, the most important results in school training escape the written test and the "per cent table."

Union of Oral and Written Testing.

The function of the written test is to supplement the searching oral test, and hence special care should be taken not to give it undue importance in school training. It is easy for a teacher to neglect or to slight the recitation proper, the best factor in such training, and make the less frequent written test a frightful bugbear to sensitive pupils. There ought to be no more anxiety or excitement connected with written tests than with oral tests; and, to this end, no more should depend on the results. They should come to pupils unheralded and as a part of their school experience. There should be no fuss over them or in view of them, and they should certainly never be made a whip or a spur to urge pupils to greater application. On the contrary, tests whether oral or written should accompany the other teaching processes as a constant stimulus and encouragement. Their pressure should not be fitful and spasmodic, but gentle and steady. The more the attention of pupils is focused on stated examinations, the more they fall into memoriter and mechanical methods of study. They work for examination marks as ends. The best work is done when there is the freest play of natural motives, and the poorest when there is an absorbing interest in examination results. The freer a school is kept from spasms of unnatural interest and effort, the better its mental training and the more wholesome its life and influence.

Not to be made a Bugbear.

CHAPTER XIV.

PROMOTION EXAMINATIONS.

FOR a few years past there has been a wide and earnest discussion of the propriety of making the results of written examinations the basis (1) for the bestowment of scholastic rewards and honors; or (2) for determining the comparative success or standing of schools and teachers; or (3) for the promotion and classification of pupils. The discussion has centered largely on the last question, to wit: *the propriety of making the results of written examinations the basis for the promotion and classification of pupils.*

Written Examinations.

In the discussion of this question there has been manifest a strange misunderstanding of the real issue; and, as a result, much inconsequential talk and no little confusion. Those who had long used written examinations in the promotion of pupils rushed to the defense of written tests in teaching as if their value for teaching purposes was the question at issue. Others minimized the value of written tests for teaching purposes, to discredit their use for promotion purposes. Thus the simple practical issue was greatly obscured. Indeed, such was the general confusion for a time that cities that discontinued the use of stated written examinations in the promotion of pupils were announced as having abolished written examinations in their schools,—and this not only in the daily papers but even in school journals!

Real Issue obscured.

Another source of confusion was the failure to narrow the issue to the use of stated written examinations in *elementary schools*. The question was often discussed from the college standpoint, and also from the use of written examinations to determine the qualifications of adults for admission to special courses of training or to professional life. The old error of treating pupils in elementary schools as adults was thus repeated. It was assumed that methods adapted to adult students in higher institutions were also adapted to young children, even to those in primary schools. No mistake in the discussion of school questions is more common or more misleading than the failure to see conditions and limitations. The tendency in considering even practical questions is to ignore limiting conditions and treat them from some theoretical standpoint as universal in their application. This tendency has been surprisingly manifest in the discussion of the use of stated written examinations in the promotion and classification of pupils. All distinctions as to the grade of schools and the age and ability of pupils have often been ignored, it being tacitly assumed that the use of the system has no limiting conditions.

Use in Elementary Schools.

Limiting Conditions ignored.

But whatever may have been the confusion in the theoretical discussion of the examination question, it opened the eyes of teachers and school officers to the fact that the use of promotion examinations in elementary schools is attended with serious evils, evils injuriously affecting teaching, study, and supervision. Nor did it require unusual intelligence in school affairs to see that the most serious of these evils are not occasioned by the

Evils of Promotion Examinations.

written examination as such, but *by the use made of the results*. When not only the promotion of pupils but also the efficiency of teachers and the standing of schools are determined by the results of stated examinations, such examinations must, in the nature of things, largely determine the scope and character of prior teaching and study, this being specially true when the written tests are prepared by the superintendent for all classes of the same grade in the schools. Experience shows that few teachers can face such a formal test of their efficiency and feel free to teach according to their best judgment and power. Increasingly as the ordeal approaches, the burning question becomes, not what is best for the pupils, but what will "count" in the examination. Under this pressure, teaching inevitably sinks into the art of preparing pupils to pass examinations, and this often becomes a pretty fine art. Former tests are scanned for "probable" questions, and the arts of the coacher and crammer take the place of rational training. Teaching thus degenerates into the art of preparing wares for the examination market.

Examinations groove Teaching and Study.

Preparing Wares for the Market.

It does not seem necessary to give in this place an enumeration of the evils that have attended stated promotion examinations in graded schools, these evils being now almost universally recognized. It must suffice to say that they have prevented the best efforts of teachers, narrowing and grooving their instruction and training; they have occasioned and made well-nigh imperative the use of mechanical methods; they have occasioned cramming and other vicious habits of study; they have caused overpressure with overstudy at the stated examination periods, often

Summary of Resulting Evils.

with injury to health; and, by no means least, they have permitted and encouraged routine and mechanical school supervision, the very point where the mechanism of the system touches the life of the schools.

Plans for correcting Evils.

The more clearly the evils resulting from the examination system of promoting pupils have been recognized, the more evident has become the necessity of their correction. There are few cities in the country that have not adopted plans for lessening these evils, while city after city has abolished the examination system and provided for the promotion of pupils chiefly on the judgment of teachers, this judgment being expressed in some cases in monthly estimates of pupils' work and attainments, the same being recorded in a simple manner. Indeed, this movement to remedy the evils of the examination system of promoting pupils has been a marked feature of recent progress in the administration of public schools. When the author's "Elements of Pedagogy" was published in 1886, the promotion of pupils on the results of stated written examinations was general in the graded schools in the United States. At this writing pupils are promoted on the judgment or estimates of teachers in many cities, including a score or more of the largest cities in the country, and many other cities make the teacher's judgment a considerable, if not chief, element in the promotion basis.[1] The testimony is conclusive that the non-use of stated promotion examinations has been attended with a gratifying improvement

Judgment of Teachers.

[1] The change in Great Britain has been even more general and marked than in the United States. The Government School Inspectors in England are not permitted to hold examinations at stated times and the ranking of schools and pupils is no longer based on examination results.

in the spirit of the schools, in less mechanical and more rational teaching, and generally with more satisfactory results; and, where the estimate plan has been intelligently administered, there has been no loss in classification.

Supervisory Efficiency required.

It is conceded that the promotion of pupils on the judgment of teachers requires efficient oversight, and this is true whatever may be the mode of ascertaining such judgment, — the weakest being the recommendation of teachers *at the time of promotion.* But efficiency in the supervisory office is essential to all effective administration of schools. When a superintendent or principal is not competent to secure from teachers reliable judgments as to the attainments of their pupils, a change is needed either in teachers or in supervisor.

Reliability of Teachers.

There is no more necessity for vitiating differences in the judgments of teachers as to their pupils' success than in examination results when the papers are read by different persons. Several experiments have shown that teachers in different schools will vary from ten to twenty per cent in marking the same papers. Teachers as a class are as reliable in their estimates as in grading examination papers. When the estimate plan was adopted in Cincinnati a former superintendent expressed the fear that the upper grades would be crowded with ill-prepared pupils; that poor pupils would be advanced by teachers "to get rid of them!"

The results showed that a smaller percentage of pupils were promoted to the higher grades under the estimate plan than had been previously promoted under the examination system, and this was not an unanticipated

result. Examination results often promote pupils who, in the judgment of their teachers, are not prepared to do the work of the next higher grade, this being frequently the case when promotion tests are grooved to an outlined narrow course of instruction. Indeed, every teacher of experience knows that it is possible to prepare weak pupils to pass grooved examinations, just as managers of normal institutes of the "revised type" know that it is possible in two or three weeks to prepare poor scholars to pass examinations for a teacher's certificate, this being done in several states year after year as a means of school progress!

Result of Experiment.

It is, however, conceded that it requires more intelligent oversight to promote pupils on the judgment of teachers than upon the results of stated examinations, but this is true of all rational school work. True teaching requires higher qualifications in the teacher than poor teaching. The more mechanical the method, the lower the qualifications required to use it. Rational methods always require high intelligence and skill. Scientific methods are possible only to teachers who possess scientific attainments and insight.

Intelligent Supervision needed.

TEACHING TESTS.

It seems unnecessary to add that the promotion of pupils on the judgment or estimates of teachers does not prevent the freest use of written tests in teaching. As already shown, the test is a vital teaching process, and, whether oral or written, its results enter into the teacher's judgment of the pupil's

Teaching Tests.

attainments. Such a judgment necessarily includes not only the pupil's fidelity but also his success in school work, and success is largely shown by the tests that go *pari passu* with instruction. It is true that the results of teaching tests may not enter mechanically or mathematically into the teacher's estimates, but they are none the less real and trustworthy. There is no surer evidence of a pupil's fitness for promotion than his fidelity and success from month to month in the work of the grade from which he is to be promoted.

Supervisory Tests.

What has been said of teaching tests also applies to supervisory tests, that is, tests instituted by a principal or superintendent to disclose defects in teaching or study, or to suggest changes in methods of teaching. It is true that defects in school work may usually be learned by intelligent inspection, but it is sometimes desirable to give pupils an opportunity to see for themselves the limitations and imperfections of their attainments. There is no such eye opener for a teacher or a class as a searching written test instituted to disclose defects, and there is no better way to disclose the need of better methods of instruction and study. To these ends the results of such a test do not need to be recorded. The bookkeeping business kills the supervisory as well as the teaching test. Its purpose is not to compare teachers or pupils, but to render both teachers and pupils needed assistance, and hence supervisory tests should be kept in close touch with the work of the school. It is too late to discover at the close of a term or year that pupils have been improperly taught, or have failed to do assigned work. This information should be ascertained in time to correct errors and secure more satisfactory results.

It is also to be noted that promotion tests cannot well be made to serve the purposes of teaching or supervisory tests. It is always difficult to prepare promotion tests that will be suggestive to teachers, and, at the same time, *fair to pupils*. If the questions are much broader than the teaching, they are liable to "slaughter" the pupils; and, if they are not broader than the teaching, they are sure to narrow and groove the teacher's work. The attempt to make promotion tests disclose defects in teaching or in the course of study always involves this serious dilemma. They are either unfair to the pupils, causing them to fail of promotion, or they have little supervisory value. There is certainly no place here for the vicarious principle that one class of pupils may be made to suffer for the benefit of the pupils who are to come after them.

Promotion Tests poor Teaching Tests.

A supervisory test may properly go outside of the known work of the teacher, for the very purpose of making it broader. It may wisely be designed to disclose what pupils do not know, and to suggest a more rational and effective method of teaching or study. The writer once sent a series of questions into an eighth year grade to call attention to the fact that it is possible for pupils to repeat certain statements respecting the change of seasons and not have much real knowledge of the subject. The questions submitted included the following:

Nature of Supervisory Tests.

1. (*a*) Why is it warmer at noon than at 9 o'clock in the morning? (*b*) Why is it warmer in Ohio in July than in January?

2. (*a*) In what month is the sun nearest the zenith at noon in Cincinnati? (*b*) In what month is it farthest from the zenith at noon?

3. What is the difference in degrees between the highest and the lowest altitude of the sun at noon in Cincinnati?

4. (*a*) Is the sun at this time (November) going from or approaching the zenith? (*b*) When will there be a change? When the next change?

5. If you lived at the equator, would the sun ever be directly over your head at noon? If so, when?

6. (*a*) In how many and what months is the sun north of the zenith at noon at the equator? (*b*) In what months is it south of the zenith at noon?

7. (*a*) Are the rays of the sun ever vertical at the tropic of cancer at noon? If so, when? (*b*) Are they ever vertical north of the tropic of cancer? At the tropic of capricorn? If so, when?

8. If you lived on the equator, in what direction would your shadow fall at noon in July? In January?

9. In what month are the shadows of vertical objects in Cincinnati longest at noon? In what month are the shadows shortest? Why?

10. (*a*) When does the sun rise exactly in the east? (*b*) In what months does it rise north of east? South of east? (*c*) When does it rise farthest north of east?

11. When the rays of the sun are vertical at the tropic of cancer, which zone has no day? Which zone has no night?

12. (*a*) Which pole of the earth is now (November) in continuous darkness? (*b*) Which will be in continuous darkness next April? (*c*) Why the change?

Returns made.

The returns made by the teachers included (1) the number of pupils examined; (2) number who answered question 1 correctly; (3) number who answered 2 correctly, and so on to 12. It is evident that such a report would give a superintendent a general idea not only of the general character of the instruction, but also its weak points, knowledge that could not have been gained from percentages of correct answers on the series of questions as a whole. A suggestive conference with teachers of the grade resulted in an earnest review of the subject, with greatly improved attainments. It is plain that it would have been a great

injustice to the pupils if these questions had been made a promotion test.

Classification of Pupils.

The classification of pupils in a graded system of schools is at best attended with serious difficulties. While the highest success in class instruction requires that pupils possess nearly equal ability and attainments (p. 141), the interests and needs of pupils require that each be given an opportunity to do the work best suited to his ability and condition. It thus appears that there are two somewhat conflicting factors in the classification of pupils, to wit: the demands of the class system for uniformity, and, over against this, the interests and needs of pupils. It is not difficult, as experience has shown, to subordinate the latter to the former, but the supreme obligation of the school is *to subserve the interests of its pupils.* The system is for the pupils, and not the pupils for the system. Moreover, the proper classification of pupils involves other elements than the basis of promotion, howsoever determined. The problem includes the course of instruction, the interval between successive classes, the number of classes in a room, etc., questions somewhat foreign to our present purpose.

Meaning of Reforms proposed.

It must suffice to add that the reforms in the promotion and classification of pupils herein reviewed or suggested do not involve the exclusion of the searching examination, oral and written, from school training. On the contrary, they mean a closer and more helpful union of testing and instruction, the former being made the open eye, the guide, and the spur of the latter. They mean the freeing of examinations from the rule of the program, making them spontaneous, occasional, helpful, and free.

They mean that the teacher shall ask, "What is best for the pupil." and not, "What will count?" They mean that teaching is to be a noble art, and not the sorry trade of preparing wares for the examination market. They mean that the teacher shall know the ability and progress of his pupils, and that his knowledge shall be respected and honored. They mean, as elsewhere stated,[1] that the principal is to be the head teacher, and not the pencil sharpener and the boss whipper; the trainer and guide of teachers, and not a crank turner and method grinder. They mean that the superintendent is to be the instructor, inspirer, and leader of the teaching corps, and not a mechanical engineer of the school machine. They mean that the schools are to be for the pupils, and not the pupils for the schools. They mean that health and vigor are to stand before per cents; mental power and culture before cram, and moral character before rank. They mean that school life is to be more and more an inspiration and delight to all youth that love knowledge and mastery.

[1] White's "Promotions and Examinations in Graded Schools," p. 61.

CHAPTER XV.

PRIMARY READING.

Principles and Methods.

In no other branch of school training is a clear knowledge of the ends to be attained more important than in the teaching of reading, and this is specially true in the first lessons. The importance of this knowledge of ends is enhanced by the fact that reading is not a simple art with a single guiding end, but is a complex art including several simple arts with different ends. This fact has not always been recognized in the devising and advocacy of methods of teaching reading, and unfortunately too great stress has been placed upon so-called methods.

Two general views as to the results to be attained in teaching reading to children have dominated in the devising and use of methods. One of these views looks upon silent reading as the art of recognizing in succession the words on the written or printed page, oral reading adding the correct pronunciation or utterance of these words with a proper observance of the pauses. This was the view generally held by elementary teachers when the writer was a child in school. The other view regards silent reading as the art of getting the thought expressed by written or printed words, oral reading adding the proper utterance of the thought and feeling thus apprehended.

Two Views.

It is not meant that either of these views wholly excludes the other. Those who hold the first view, recognize in some degree that reading is a means of getting the meaning of the printed page, but in their methods they specially aim at word calling, and not at thought getting. Those who hold the second view recognize the fact that word recognition is a necessary means of thought reading, but their methods specially aim at the grasp and utterance of the thought.

Special Methods.

The practical difference of these two views will be more clearly seen by a glance at the special methods which they have inspired.

The first has resulted in the devising of the a-b-c method, the syllabic method, the phonic method, the so-called synthetic method, each of these methods having for its primary aim the training of pupils in the power to recognize and pronounce written or printed words. The phonic and synthetic methods are based on the fact that the sounds which compose a spoken word give, when synthesized, the name of the printed word. Many words when spoken are composed of the sounds of all the letters which make up their printed form, and hence these purely phonetic words are readily taught.

The second view of reading has resulted in the devising of the word method, so strongly advocated by Horace Mann, the sentence method, and the so-called thought method, each method having for its special end the training of pupils in the power to get the thought expressed by written or printed words; in other words, the training of pupils in thought reading and not in mere word calling. It is to be noted that each of these three methods takes its name from the one feature in the initial steps in reading that is specially emphasized by it.

The limitations of the several methods of teaching reading, named above, are evident when viewed in the light of the different acts or processes that are included in the art of reading. Reading includes (1) the recognition at sight of the written or printed words, (2) a knowledge of their meaning and use, and (3), in oral reading, their correct and facile utterance. These acts or arts are essential to the reading of a sentence. In addition to this essential word mastery, the art of reading includes (4) the grasp of the thought and feeling expressed by the words, and (5), in oral reading, their correct and clear expression. But in order that the thought of a sentence may be readily apprehended, the eye must acquire the art of taking in the sentence as a whole *by a synthetic glance.* So long as the eye and the mind linger on successive words, hitching from one word to another, sentences as wholes are not seen, and the easy grasp of the thought and its proper vocal expression are not possible. The act of taking in a group of words with a quick sweep of the eye must become automatic before facile reading is possible. There must be word recognition without the focusing of attention on the successive words. Reading involves a rapid synthesis of words and ideas, the synthetic glance of eye and mind.

Limitations of Methods.

Acts included in Reading.

This brief analysis of the different acts involved in reading makes clear the importance of forming correct automatic habits in primary lessons, and this becomes a good test of the value of methods. In the light of these facts let us glance at each of the seven methods of teaching reading named above.

Correct Habits.

It is not meant that either of these views wholly excludes the other. Those who hold the first view recognize in some degree that reading is a means of getting the meaning of the printed page, but in their methods they specially aim at word calling, and not at thought getting. Those who hold the second view recognize the fact that word recognition is a necessary means of thought reading, but their methods specially aim at the grasp and utterance of the thought.

The practical difference of these two views will be more clearly seen by a glance at the special methods which they have inspired.

Special Methods

The first has resulted in the devising of the alphabetic method, the phonic method, the synthetic method, each of these methods having called synthetic method for its primary aim the training of pupils in the power to recognize and pronounce written or printed words. The phonic and synthetic methods are based on the fact that the sounds which compose a spoken word when synthesized, the name of the printed word. words when spoken are composed of the sounds the letters which make up their printed forms, and these purely phonetic words are readily taught.

The second view of reading has resulted in devising of the word method, so strongly advocated by Horace Mann, the sentence method, [illegible] thought method, each [illegible]

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The a-b-c or letter method aims primarily to teach words as *forms*. It proceeds on the assumption that written or printed words are recognized from the letters of which they are made up. The method has been widely condemned on the ground that it cannot give pupils the power to make out new words, and, for the reason, that the names of the letters of a word are not when synthesized the name of the word. Thus, the names of the letters *c a t*, when spoken together, do not give *kat*, but *se-a-te*. Yet notwithstanding this objection, many thousands of persons taught by the a-b-c method have, in some way, early acquired the power to recognize even new words at sight, and the deaf readily learn to recognize words as forms without their knowing the names, much less the sounds, of the letters that compose them. As will appear later, the ability of children taught by the letter method to make out new words, is largely due to syllabic power, often acquired unconsciously. The special weakness of the old a-b-c drill was the focusing of the pupil's attention on the letters in the successive words, resulting in the automatic habit of letter and word attention with indifference to the thought, often resulting in the very bad habit of hitching from word to word, the eye and the mind keeping step together. In the writer's boyhood in school he stood in the reading class next to a much older boy who spelled mentally every word read, usually moving his lips at each letter. This was done automatically on words perfectly known, as "and," "to," "is," "was," etc. This idiotic habit was early formed by "spelling words out loud" before pronouncing them, a stupid practice in the old-time school. Thou-

The a-b-c Method.

Automatic Habit.

sands of persons thus drilled in childhood have never been able to free the eye to take in words as wholes, much less a group of words or a sentence.

The ability to recognize syllabic combinations of letters is the real secret of the a-b-c method in giving pupils facility in recognizing new words at sight. In the old-time school the reading and spelling drills passed from the alphabet to combinations of letters, first those of two letters, as *ab*, *eb*, *ib*, *ob*, etc., then combinations of three letters, and so on. Pupils were thus made familiar with those type combinations of letters which constitute the syllables in English words. It was this *syllabic drill* which gave young pupils the ability to recognize and pronounce words with facility. At less than six years of age the writer was able to read the New Testament with undesirable rapidity, that is, was able to name the words. It is a question whether pupils intelligently taught by this syllabic method did not become as skillful word readers as those now taught by phonic methods. The start was slower, for syllabic skill was at first acquired somewhat unconsciously, but when what are called the syllabic *phones* of English words were mastered, progress was rapid. When the syllabic habit and the syllabic sense are established, new words are made out with greater facility than by the synthesis of their elements, whether letters or sounds. Certainly, the oral naming of the letters in words is small, if any, help in their recognition, while the *habit* of doing this is a fatal obstacle to natural reading.

The Syllabic Method.

The phonic method aims to associate the sounds of letters with their forms, and to train pupils in the synthesis of the sounds of the several letters in words.

Words are thus made out by a synthesis of their phonic elements. The method is evidently most successful in teaching purely phonetic words, that is, words which are made up, when spoken, of the sounds of all their letters. Fortunately, the child's vocabulary contains many such words, as is shown by an ordinary primer.

The Phonic Method.

The phonic method was in use in Boston and several other American cities early in the fifties. In the first lessons in reading, pupils were persistently drilled in the phonic analysis of words, and this was attended later by the use of diacritical marks. This training resulted in a good degree of skill in making out new words and increased accuracy in the pronunciation of words. But the attention of the pupils was largely focused on words, and reading became largely a process of word calling, the grasp and expression of the thought receiving little attention.

Early Use of Phonic Method.

In the sixties a new impulse was given to the phonic method by the invention of the Leigh type in which each letter had a special form for each of its sounds, the original form of the letter being well preserved. This "Pronouncing Orthography," as it was called, was used for several years in the schools of Boston, New York, St. Louis, Washington, and several other cities, and the success of the device was strongly attested in the successive reports of the cities named. Indeed, so great was the demand for the new pronouncing type that an edition of the primers in several standard series of readers was printed in it. But as early as 1880 the Leigh type had largely disappeared from American schools, being displaced in many instances by the use of diacritical marks.

Leigh Type.

The English phonic systems have had a like history. The "Robinson Phonic System," one of the most complete yet invented, is now, according to the testimony of D. Salmon,[1] practically dead, "the instruction book being actually out of print." Sir Isaac Pitman's "Phonetic System" was designed to be used as an introduction to the reading of common type, and though the method was enthusiastically pushed both in England and America its actual use in the schools was limited.

The so-called synthetic method takes its name from the fact that it lays great stress on the teaching of words by the *synthesis* of their phonic elements. It makes free use of diacritical marks to denote the pronunciation of words, and rules are given for the sounds of vowels, for silent letters, etc. The special stress of the reading exercise is given to the "marking" of words, the repeating of phonic rules, and the pronunciation of words by a synthesis of their elementary sounds. This is often continued by enthusiastic teachers for months as if it were a necessary process in learning to read.[2] The result is commendable skill in pronouncing new words, but the method focuses the attention unduly on words, with resulting indifference to the grasp and expression of the thought, and this often becomes an automatic habit not easily overcome.

The Synthetic Method.

The use of diacritical marks in first lessons in reading is easily overdone, a liability that attends the use of

[1] Salmon's "Art of Teaching," p. 79.

[2] "I remember hearing a teacher chide a pupil for reading a sentence before she had time to mark the vowels, but since the child could and did read without such help, the marking was evidently unnecessary." — SARAH LOUISE ARNOLD in "Reading: How to Teach It."

all mechanical devices. These marks may properly be used to denote the sounds of letters, and also the pronunciation of words written or printed separately; but the words in the sentences *to be read by pupils* should not be thus marked. The habit of relying on such artificial aid becomes an actual hindrance in reading common type. The fact seems to be overlooked that children learn to speak correctly hundreds of words without any aid from the eye.

Diacritical Marks.

The fact that the making out of words either from their letters or their phonic elements proves a hindrance in the proper reading of sentences suggested to Mr. Webb and others that the words occurring in the first lessons in reading should be taught *as wholes*, and in advance of sentence reading. It was found by trial that this could easily be done, and the recognition of the words at sight thus be secured. This made it possible to train the eye to take in groups of words and sentences, and to direct the attention to the thought to be grasped and read.

The Word Method.

This method, called the word method, was in use in the primary schools of Cleveland as early as 1854, possibly earlier, and the pupils read lessons from the board and from charts and primers with charming natural expression. In the opinion of the writer no other city in the country secured at that day such an admirable reading of the thought by young pupils as Cleveland. All new words in reading lessons were taught in advance of any attempt at the reading of the sentences. As a result there was no hitching from word to word and, under skillful teaching, no hesitation on words. The pupils were trained to take in

Early Use.

groups of words and sentences by a synthetic glance, and the reading was free, natural, and expressive.

But it was soon evident that the method was being used too exclusively and much too long. Even second-year pupils had small ability to make out new words, and their indifference to the letters in words appeared in poor spelling. The result was a striking example of the persistence of habit when action becomes automatic. It was also found that the pupils largely relied upon the teacher or other person for new words, and this resulted in their stumbling over untaught words, even in simple lessons. Means were soon employed to supplement the method and correct its tendencies. Its exclusive use was limited to three or four months, and when pupils had acquired the power to take in at a glance groups of words and sentences, it was dropped even as an initial step.

Weakness of Method.

The so-called sentence method begins with the sentence *as a whole.* A fact is developed objectively and expressed in an oral sentence, and then this sentence is written on the board. The pupils look at the marks on the board and repeat the oral sentence, and this is called reading the sentence as a whole. The several words in the sentence are next taught, first as wholes (word method), and then the sentence is read by a synthesis of its words. In a few weeks many sentences may thus be given, and the pupils taught to recognize scores of words at sight.

The Sentence Method.

It is evident that the sentences written on the board are not at first *read* in any true sense of the word. The so-called reading is simply a repetition of the oral sentence, and this would be done just as well if there was no separation of the words in the writ-

Sentences not Read.

ten sentence; as for example, "*Maryhasanappleinherhand.*" The repetition of this sentence, even while looking at it, is not reading it. Instead of getting the thought from the sentence, which is reading, the thought is put into the sentence. In speech and writing thought is put into sentences; in reading thought is gotten out of written or printed sentences. The sentence method puts the emphasis on the reading of the sentence, and secures from the first the natural expression of the thought. Its superiority to the word method is, however, not evident.

The sentence method is also called the thought method for the reason that the process begins *with the thought*, at first expressed orally. The order is first the development of the thought, next its oral expression, and then the writing of the sentence on the board. One of the earliest advocates of this method of teaching primary reading,[1] called it "The Thought and Sentence Method," but the process became generally known as the sentence method, and, to a more limited extent, as the thought method.

The Thought Method.

One of the common reasons assigned in the advocacy of the device was the assumption that the thought is the unit of knowledge, and hence the sentence is the unit of language. This was put forth as the "philosophy" of the method; but it so happens that the thought is not the unit of knowledge, but rather ideas and concepts, which are expressed by words. An idea or a concept is as truly knowledge as a thought. Such groups of words as "a tall tree," "a large boy," "the blue sky," "the green grass," etc., as

Philosophy of the Method.

[1] Mr. George L. Farnham, then Superintendent of the public schools of Binghamton, N.Y.

truly express knowledge as the formal sentences "The tree is tall;" "The boy is large;" "The sky is blue," etc. Indeed, the child's first knowledge is expressed by single words and by phrases, not by formal sentences. The word method used by skillful teachers demonstrated the fact that children may be as greatly interested in ideas and concepts and their expression as in sentences. Moreover, the thought or sentence method has at best a very limited use, it being best used in connection with sentences written on the board. It has no practical advantage when the primer or first reader is reached.

It is doubtful whether the thought and sentence method should be used continuously even for a few days. When used, immediate attention should be given to the words, and the pupils should be trained in passing from the words to the sentence and its thought. Otherwise pupils become dependent upon the teacher both for the thought and its expression, and this results in careless reading, the omission or insertion of words, etc. This is especially true in reading long sentences or those in which modifying words are not essential to the expression of the main thought. Pupils glance at sentences as wholes and "jump at the thought." **Limited Use.**

It is evident from this brief survey that no one of the so-called methods of teaching reading is a complete method, even for the first lessons. Each is a device for the attainment of a certain result, and this is only one of several results that are attained in the complex art of reading. Moreover, it is seen that the exclusive use of any one of these methods, even for a few weeks, results in some habit or tendency that must **No Method Complete.**

be corrected before accurate and natural reading is possible.

These facts suggest that the first lessons in reading should be given by such a combination of processes or methods as shall result not only in necessary word mastery but also in facile thought reading. It is also evident that this involves the teaching of words in such a manner as not to prevent early and persistent practice in sentence reading, the grasp and expression of the thought. It is possible that this result may not depend on any special combination of processes or on any given order of procedure. More may depend on the teacher's clear knowledge of the results to be attained, and her skill in recognizing and meeting the needs of the pupils. It may, however, be helpful to suggest ways in which desired results may be secured and bad results avoided. This will be attempted in the next chapter.

Union of Methods.

CHAPTER XVI.

FIRST LESSONS IN READING.

Union of Methods.

It is essential that the child read from the first not only words and phrases, but, increasingly, sentences. To this end, the first reading lessons should be given by the use of the blackboard. No chart or primer can take the place of the blackboard in these beginning lessons. The only wise use that can at first be made of chart or primer is to supplement the board lessons.

The use of the board involves the question whether script or print or both should be used in these first lessons. Experience has fully shown that there are advantages in first using plain script.[1] The teacher can multiply sentences much more readily in script than in print. Nothing is gained by the use of both script and print from the first. When the time comes to use a print chart or primer, the transition from script to print is quickly made, the similarity of script and print words greatly lessening the supposed difficulty. Besides, script charts may be used in connection with the early board lessons.

Script or Print.

The writer has in recent years changed his opinion on the propriety of requiring young children to write the words first taught, and especially in schools that

[1] For a helpful presentation of the first steps in reading, see "Elements of Pedagogy," pp. 221–237, and Miss Arnold's "Reading: How to teach It," Chapter III.

receive children at five years of age. There should be very little, if any, pen or pencil writing or printing by children at this early age, the reasons for this view being somewhat fully given in a previous chapter on Written Exercises. The early use of the pencil should be in drawing exercises with freer movements.

Writing First Year.

In these board exercises care should be taken to introduce all words, phrases, and sentences first orally. The true order here is first the idea or concept or thought, as the case may be; then its oral expression by word or phrase or sentence, and then the written word or phrase or sentence on the board. Reference has been made in the preceding chapter to the stress placed by some teachers on beginning with the sentence, first oral and then written, and then passing to the words therein. For reasons there given this order does not seem important. To *read* a sentence the mind must pass from the words therein to the sentence, and hence the first step in reading a sentence is to know the words. When a child knows and can speak a word, he quickly learns its written form, knowing it then both as a sound and as a form, through the ear and the eye.

Board Lessons.

There is no difficulty in interesting children in reading words and phrases; and their interest in sentences is greatly increased by the conscious process of *reading them.* Some teachers may succeed best in picking the words to be learned out of sentences written on the board, but sentence reading is possible only when this process is reversed. The essential thing is to give the child the power to pass from known words to sentences. Moreover, the natural and expressive

Word Method.

oral reading of sentences depends much on the proper reading of the phrases therein, what is technically called *phrasing* being essential to correct sentence reading.

But whatever may be true of the first score or more of sentences taught, children must soon come to the reading of sentences made up of known words; and to this end, *word mastery must precede sentence reading*. It is not possible to read a sentence made up of unknown words. Great care should be taken the first few weeks to make children familiar with all new words as *wholes*, both as sounds and as forms, before they attempt to read sentences in which these words occur.

Word Mastery.

In the reading of sentences children should be trained to pass by a synthetic glance from the words to the sentence as a whole; and, from the first, their sentence reading should not be the mere calling of the successive words, but the grasp of the thought and its oral expression.[1] To this end, the teaching of words as wholes (word method) and their combinations in phrases and sentences should be continued until pupils have acquired the art of "taking in" short sentences at a glance and reading the thought with ease and natural expression. This is the basis of the art of reading, and the sooner it is acquired the better. In the absence of this fundamental skill, there can be no true reading.

Sentence Reading.

It has been found by wide practice that this necessary training in sentence reading may require the teaching

[1] A pointer should not be used in reading blackboard sentences. Pointing to the successive words in a sentence necessitates the pupil's hitching from word to word instead of taking in the sentence as a whole. The pointer may be used in *word drills*.

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of a hundred or more carefully chosen words, words expressing ideas and concepts made familiar to the pupils. With these words hundreds of phrases and sentences, expressing observed and known facts, may in a few weeks be formed, written on the board, and read by the pupils in a beautiful manner. In these exercises, objective instruction and the oral expression of knowledge may be effectively united with reading. The child's early lessons in reading should be eminently lessons in talking, in expressing thought, as well as in reading thought.

Limit of Word Method.

But the end sought in teaching words as wholes is attained in a few weeks, and the reading drill must now afford the pupils needed training *in making out new words for themselves.* Instead of pronouncing new words for the children, the teacher must help them to pronounce them. This introduces the phonic method, by which pupils reach the pronunciation of words by a synthesis of their elementary sounds. While pupils are learning words as wholes, and reading with increasing skill sentences composed of them, the teacher should *in separate exercises* begin to make them familiar with the phonic elements of spoken words, words as sounds. In these drills the appeal at first should be *wholly to the ear*, with no reference whatever to the written or printed word. The objects with which these phonic exercises deal are *sounds*, and the eye can render no assistance in either their analysis or synthesis. Indeed, the written word may be an actual hindrance in dealing with the spoken word.

First Phonic Drills.

This training may begin with drills in the recognition of words when slowly pronounced, the sounds being suf-

ficiently separated to be easily recognized, as *m a n*, *t o p*, etc., and then the sounds may be so widely separated as to be presented to the ear as separate sounds, the pupils making out the word by a synthesis of its elements. They may next be trained in the separation of spoken words into their elementary sounds. A few moments each day devoted to such drills will enable the youngest pupils to catch a spoken word of one syllable in the "conscious ear," and separate it with care and accuracy into its elements; also to unite given phonic elements and form words.

When pupils become somewhat skillful in the analysis and synthesis of spoken words, the next step is *to associate the elementary sounds with the letters which represent them.* This involves the use of written words, the union of the ear and the eye in the phonic exercises. It seems unnecessary to give the details of the process. The result to be finally attained is the pronunciation of new written words by a synthesis of their phonic elements. This is easy when the words are purely phonetic, and there are other words that present no special difficulty. The early phonic drills should be limited to these words, and special difficulties avoided. Words will be met whose pronunciation is to be given by the teacher.

Association of Sounds and Letters.

Our English words present many phonic difficulties. There are few teachers who can accurately analyze by sound all of the words in an ordinary primer. Indeed, the great majority of elementary teachers cannot give accurately all of the elementary sounds. The writer witnesses few exercises in the phonic analysis of words without noting obvious errors.

Phonic Difficulties.

There are several classes of words whose phonic analysis is very difficult. These include words in which the vowel is modified by coalescing with the liquid or subvocal which follows it, as in *man, fast, chance, mercy*, etc. There are few teachers who can give the exact vowel sound in such words, and there are many who do not pronounce this class of words correctly. Another difficulty pertains to obscure vowels in unaccented syllables, as in *primer, glutton, error, creator, cannon, secretary, evil*, etc. The vowel in such syllables often loses its distinctive character, and the sound in its place, if any, so blends with the consonant that it is very difficult to separate them. *Such syllables should not be analyzed by young pupils.* The attempt results in error.

Modified Vowels.

Further, nothing is gained by the attempt to reach by phonic methods the pronunciation of words of unusual orthography, as *thorough, trough, neigh, tongue, unique*, etc. The pronunciation of such words must be learned from the living teacher or from the dictionary or dictionary methods of representing the spoken word.

All this suggests that the phonic method of teaching words has *its obvious limitations*. The phonic analysis and synthesis of words should early be supplemented by syllabic analysis and synthesis. As soon as pupils know the sounds of the consonants and the more certain sounds of the vowels, they are prepared for drills that will enable them to recognize words which contain what may be called syllabic *phones*, without a conscious synthesis of their elements. When they know *at* they will instantly recognize *mat, rat, cat, fat, bat, sat*, etc.; from *an* they will pass to *man, fan, pan, ran, can*, etc.; from *back* to *rack, sack, black, crack*, etc.; from *light*

Syllabic Drills.

to *sight, right, bright, night, might,* etc.; from *book* to *look, hook, took, cook, crook,* etc.

As a means of training the power to make out new words at sight, there is probably no better device than the arranging of words that contain the same combination of letters in columns or in paragraphs.[1] A good beginning in this classification of type words may be made from the words in previous lessons, words that express known ideas. Above each column of words may be written the common vowel properly marked, or, if preferred, the vowel in the *first* word may be marked, thus:

Classification of Words.

ă	ĕ	ĭ	Or =			
man	pen	kit	rŏd	kīte	Kāte	mo͞on
fan	hen	mit	nod	bite	mate	noon
pan	ten	sit	pod	mite	slate	coon
ran	men	pit	sod	write	skate	spoon
etc.	etc.	etc.	etc.	etc.	etc.	etc.

The classes of words written in columns may include first those containing short vowels; then those with long vowels and then those with other vowel sounds. The marking of the vowel in all the words of a class is unnecessary, and besides it defeats in part the purpose of their classification, to wit: *the training of pupils in pronouncing syllables from type combinations of letters.* Pupils may thus be made familiar with all the common syllabic phones.

When these type combinations of letters are instantly recognized by pupils, the phonic analysis of words should give place to syllabic analysis, and pupils should be trained to pronounce new words

Syllabic Analysis.

[1] This is a return to a form of the old syllable drill which gave the writer and other pupils of the early day the key to new words.

by recognizing their syllables and synthesizing them. Such words as *finish*, *manners*, *interest*, *necessary*, etc., are thus instantly known.

This syllabic skill is an important factor in reading; and, when acquired, there is little, if any, gain in the continued analysis of words into their phonic elements. Much time may be wasted in the repeated phonic analysis of words that present no difficulty in reading or spelling. The method has value in all grades in teaching the pronunciation of difficult words, and words commonly mispronounced, this being specially true of foreign words. This is the place where diacritical marks have special value. Skillful teachers find little difficulty in teaching children to read common type.

In four or five months pupils may begin to write words as they learn them, thus becoming familiar with the elements of words as *forms*, or what is known as the spelling of words. But pupils are still too young to do fine writing with pencil or pen. Words should be written in large letters, and only a few moments each school session should be given to this work. The writing on slate or paper the first school year should be in what is known as a "coarse hand." In the second school year the writing of all new words in the reading lessons may properly be required; but care should still be taken not to demand too much pen work, especially with the "finger movement."

Writing Words.

It is thus seen that the first lessons in reading should aim (1) to teach a few scores of common words as wholes, including their meaning and their recognition at sight; (2) to impart to pupils needed skill in taking in groups of words, whether phrases or sentences, by a synthetic glance; and (3) to afford them

Summary.

progressive practice in the grasp of the thought in sentences and its clear and natural oral expression. When these results are fairly well attained, there may be introduced drills in the analysis and synthesis of words as *sounds*, with no appeal to the eye; and later both as sounds and as forms by a proper union of phonic and letter exercises, leading early to syllabic analysis and synthesis, the aim being to give pupils needed skill in making out new words *at sight*. In all this training special stress should be constantly placed upon *sentence reading*, word mastery being viewed chiefly as a means to this essential end.

Second and Third Readers.

It is not our purpose to present here in detail the nature of the exercises in reading in the second and third school years. It must suffice to say that wider observation and experience attest the practical value of the suggestions presented in the "Elements of Pedagogy," pp. 230–237. It is there asserted that the first step in the reading drill in these grades is the teaching of *words*, and the more thoroughly this is done the more clearly will pupils grasp and express the thought. This suggests that the reading lesson in these grades may properly consist of two corresponding exercises, the first designed to secure *a mastery of the words*, and the second *a correct reading of the sentences*, the first being preparatory to the second. These two exercises may come in the same period; or, what is better when lesson periods are brief, one period may be devoted to the mastery of the words, and the next to the reading proper, the grasp and correct utterance of the thought.

Second and Third Grades.

The stress of the entire reading drill should be placed on the *meaning* of what is read. To this end, the pupils must be interested, their feelings awakened, and their attention focused. All this requires skillful work on the part of the teacher. No mere mechanism will answer. Special skill is required to teach lessons that appeal to the imagination. The reader must see with the mind's eye the picture which the language sketches; and, to this end, the imagination must be active and responsive. It is not necessary, however, to carry the imaging into minute details not in the text. What is needed in reading is a vivid schema, not an elaborate image. Imaging in reading is easily overdone.

Thought Reading.

It is not meant that nothing is to be read in these grades until all new words therein are taught and mastered. On the contrary, even first-year pupils should be encouraged to read simple stories "all by themselves," although this may be attended with some stumbling over unknown words. It is a good plan to read and reread a simple story to a child taking his first lessons in reading; and, when the story is thus made familiar, to let the child try to read it. The fact that he knows the story will help him over unknown words, and he will be delighted to find that he can read. This will awaken a strong desire to read other stories, thus supplying a motive for effort.

Free Reading.

It is also a good practice to set apart lessons in the readers *to be studied* by pupils, and then read without any prior teaching of words or the meaning of paragraphs. This plan was tried in the Cincinnati schools with promising results. The lessons in the readers, more specially in the fourth and fifth readers, were divided into "drill lessons" and "test

Test Lessons.

lessons," the former being used to train those powers involved in correct oral reading, and the latter to test the pupil's ability "to husk the thought" of the printed page. The grasp of the thought in the test lessons was judged largely from its oral expression by the reader; and, when the expression was uncertain evidence, the pupil was questioned as to the meaning of words and phrases as well as of sentences and paragraphs, but care was taken not to make the exercise a drill in reading. Its purpose was *to test reading power.* The effort of the pupils was focused on the clear expression of the writer's thought; and, to this end, on the clear grasp of the thought. The readers used were found to contain sufficient material for both classes of reading exercises. In some schools, supplementary readers are used for this test purpose.

It should be noted that these test exercises were preceded by a careful study by the pupils of the pieces to be read, with free access to the dictionary and other aids to the grasp of the meaning. They were not expected to read new selections intelligently at sight.

Sight Reading.

This raises a question as to the practical value of much of the so-called "sight reading" in primary schools. They are often exercises in word calling, not in thought reading. The writer has seen a story, new to the children, read in a class from a single book, the book being passed from pupil to pupil. It was necessarily mere word naming, and those who listened evidently caught only the more striking incidents. It was not good practice in oral reading, and it was not easy to discover what valuable result was attained. It requires a high degree of skill to read intelligently the printed page *at sight.* Too much of the silent reading by children, and also by adults,

is the mere skimming of the printed page, with little clear grasp of the meaning, and in oral reading this becomes mere word utterance. Children need to be somewhat familiar with a story before they attempt to read it aloud. It is important that the first three or four years in school give children *good reading habits.* Something is wrong when children are taken over four or five readers with so small ability to read the printed page.

Reading Motive.

It seems important to add that it is not enough that early training in reading give due attention to what may be called the mechanics of the art. It is much more important that the child's desire to read be awakened, and that this desire be gratified and quickened at every step of his progress. An eager desire to learn to read leaps difficulties over which a mechanical routine stumbles and falls. The most vital work of the teacher is to awaken this desire, to arouse interest, and otherwise to quicken the motives that prompt effort. The child's desire to read is awakened by hearing others read that which interests him. "The child's mind," says Miss Arnold, "should be furnished with the best stories and poems before he begins his primer. So shall he long to master the art which shall open books to him for his own reading, and every step which his feet take in the path to his desire, shall bring him consciously nearer to the longed-for treasure." [1]

What should be read.

We can only glance at what children should read in these early years. It seems to go without saying that what is read by children or to them should not only interest and please, but should also create a taste for good literature; and it is here to be remembered that what is worth reading

[1] "Reading: How to teach It," p. 29.

once by a child or to a child is worth reading several times. It is not what he hears or reads that tells, but what becomes a part of his possession and life, a memory treasure.

This suggests that it is possible for children to read too many books. It is feared that in some schools young pupils are encouraged to read too much. It sometimes happens that a rivalry is created among pupils as to the number of books read by them in a given time, and an appalling number of books read is not unfrequently reported. It needs no examination to disclose the fact that many of these books are skimmed, not really read, and that much of the reading is done under conditions injurious to eyesight and to the nervous system generally. Proper attention should be given by teachers and parents to the quantity as well as the quality of children's reading. The time spent by a child over books should be limited. More play and work and less reading of stories would be a good thing for a great many young people. There is no virtue in reading of itself. All depends on what is read, and how fully it is understood and made a part of the reader's life. It is not what the eye passes over, but what the soul takes into itself that tells.

Too Much Reading.

Reading in Higher Grades.

The reading exercise, especially in the higher grades, should have for its twofold purpose: (1) the clear grasp and appreciation of the meaning of what is to be read, and (2) the natural oral expression of what is thus grasped and appreciated. The reading drill should be held intelligently to the realization of

Ends to be attained.

these ends. Its purposes are as definite as those involved in the study of a demonstration in Euclid. The one essential thing to be known is the *meaning* of the selection, and the one thing to be done is to give oral expression to this meaning. Whatever can throw light on this meaning or assist in its expression has a legitimate place in the reading exercise; but whatever obscures these purposes or dissipates effort should be excluded.

It is true that this rule may exclude many things that would be of interest and possibly of some value to the pupils, but it makes a successful reading exercise possible. It is easy to make a reading lesson an *omnium gatherum*, thus distracting attention and dissipating effort. We have recently witnessed performances, called "reading" in the school program, which were a medley of exercises with transitions that would have seemed ridiculous if they had not been so skillfully manipulated. A reading exercise that devotes five minutes to actual reading and twenty-five minutes to other things is not an ideal drill in reading, whatever else may be its merit.

Not an *Omnium Gatherum.*

It is not meant that the reading exercise should be so closely limited to the interpretation of the text as to exclude all other information. On the contrary, it may be well to approach the reading of a piece of literature by an interesting sketch of the author, some account of his other literary productions, the circumstances under which the piece was written, if of special interest, the author's purpose in writing it, and whatever else may interest pupils *in the selection* and otherwise assist them in its intelligent study. This preparatory instruction may be given in a separate exercise or it may be made an inspiring part of the lesson's assign-

Preparatory Instruction.

ment. There may also be special vocal drills to impart to the voice desired flexibility and power. But when the pupils come to the interpretation of the text, to its actual reading, everything should be excluded except the author's meaning and its proper expression. The process of reading is necessarily limited *to what is read*, and on this the attention must be focused. The reading of a piece of good literature should be clean and fruitful work.

Concentration of Attention.

Books for use in teaching the art of reading, especially in the higher grades, should largely represent the literature of power rather than the literature of knowledge. Such literature not only touches more vitally the sources of mental and spiritual life, but it affords the best possible training in oral expression. The use of books of information or science as school readers has not been successful. The so-called science readers, geographical readers, natural history readers, and the like, have a small use even as supplementary readers. The use of even histories as readers has not been satisfactory, though history is rich in human interest. The pupil should come under the ennobling influence of the best literature early in the school course, and, increasingly, he should be responsive to its humanizing power.

School Readers the best Literature.

CHAPTER XVII.

LANGUAGE TRAINING.

Guiding Principles.

The art of language is the most fundamental and practical of the school arts. It follows that the teaching of this art, which is begun in the nursery and continued in the kindergarten, should be a central aim of the elementary school.

Language Training, First Two Years.

When children enter the primary school at say six years of age, they have many ideas, a considerable vocabulary of words, and more or less ability to express what they know and feel in words, phrases, and sentences. The first two years in the primary school should largely increase their store of ideas and facts, their usable vocabulary, and their ability to express their knowledge by language. To this end, there should be well-directed and persistent training in the use of language in the primary school.

Results to be attained and Exercises.

This training in language should make clear and definite the ideas expressed by the words used; should give the pupils the mastery of these words as sounds and forms; and the teaching of knowledge should, as far as possible, end in its clear expression by the pupils. The daily exercises of the primary school, the first year especially, should include conversations using freely the incidents of child life: talks about common things and experiences, the telling

of stories of special interest to young children, the recital of little poems, the singing of child songs, the development of material for reading lessons, etc. These and other simple exercises may be made fine training in the power of oral expression.

In the latter part of the first year pupils, especially if not admitted until they are six, may begin to write words and short sentences, and during the second year they may have increasing practice (not too much) in writing sentences and paragraphs, thus acquiring some skill in the use of the simplest written forms of English. **Writing.**

The first two years of school may thus afford children an admirable training in telling what they know and feel, the vital art, and may increasingly give them practice in writing. All this language training may be so united with the other exercises of the school as to be a part of them, thus practically realizing the principle of concentration. This union is eminently practicable in the exercises in reading; the exercises in expression affording material for reading, and the development of reading lessons affording fine practice in oral expression. Indeed, the telling of what one knows and feels and the reading of thought and feeling expressed in written language are but different phases of the same mental process. **Union of Language and other Exercises.**

Every exercise of the primary school that leads to knowledge properly ends in the expression of such knowledge by the pupils. This is true of the lessons in nature, on human life, morals and manners, etc. When training in expression is the end, it is a mistake to let even a story exercise end with the telling of the story by the teacher. This **Exercises should end in Expression.**

may interest and please the pupils, may make a desired impression, but the vital matter is reached when the story is retold by the pupils. It is what children can tell that is evidence of real appropriation.

The emphasis has been laid above on *oral expression*, and this for the reason that facility in speech is much more important in early training than written expression. There should be comparatively little writing the first two years of school. In all primary training in language the tongue should go before the pen.

The Tongue before the Pen.

If the training in expression in the primary school is skillful and abundant, the pupils will come up to the third school year with a familiar vocabulary of several hundred words, with a good degree of facility in telling what they know, and with some skill in writing sentences and simple paragraphs. Nor are these mean attainments in language at this early age. On the contrary, they are a good beginning in the learning of this difficult but important art.

Attainments in Two Years.

It is here conceded that this concurrent training in expression should be continued throughout the school course, every exercise being made a training in expression. But this is not enough. This incidental training needs to be supplemented by exercises which make clear and facile expression their chief end and purpose. "The common child," says Dr. Hinsdale, "will not pick up the elementary school arts by the way without his knowledge, but he must consciously learn them."[1] This is especially true of the art of language. The pupil may acquire and ought to acquire a fair degree of facility in expression in con-

Incidental Training not Sufficient.

[1] "The Language Arts," p. 53.

nection with other school exercises, but the highest facility can be attained only by practice in which *the attention is focused on expression.*

It follows that the school course should provide separate exercises in language, and these exercises should have as regular a place in the daily program as the arts of reading and number, arts which require progressive practice during most of the elementary course. The art of language is more difficult than reading or numerical computation, and it should certainly have as large a place in the elementary school. *It should be a daily exercise.* Nor does the fact that every teaching exercise should be made a training in expression do away with the necessity of separate language exercises, exercises specially devoted to training in the facile use of language. Every oral exercise should be a training in vocal expression, but this cannot take the place of the reading exercise. Nor should separate exercises in language lessen the attention given to expression in the other school exercises. What is needed is *both* incidental and regular training in expression, conscientious language training all along the line. There is no danger that the important art of language will receive too much attention in school training.

Separate Language Exercises.

Since the Council's "Committee of Ten" emphasized so strongly (not too strongly) the importance of incidental language training, it has become the fashion to discredit what is characterized as "formal" language exercises. It is claimed that facility in language is best acquired by its use in connection with other school exercises, and much stress is laid upon "extemporaneous composition." The "Harvard Com-

Formal Exercises.

mittee on Composition" urges that by daily and incessant practice pupils should early acquire that degree of facility in writing that will enable "the student or adult to use it as a tool in his work."

This is true, but it should be specially noted that this facility is never acquired by careless writing, by writing in an extemporaneous fashion, much below one's ability. In no art is skill increased by practice that is below one's power and skill. On the contrary, practice that is below one's ability lessens skill. It begets the habit of indifferent effort, and in language this is fatal. It is only by doing one's best in expression that the power to do better is acquired.

Facility not acquired by Careless Writing.

In the past few years there has been a large increase in the amount of written work required of pupils in grammar and high schools, as written lessons, written outlines, written reviews, etc., and much of this written work is of the "extemporaneous" sort (p. 169). But little of it comparatively passes under the eye of the teacher, and much of it is written with small effort at the best expression. It is possible that this careless written work in preparatory schools may be responsible for some of the low attainments in English that so puzzle the Harvard examiners. Experience shows that written work is likely to be careless and imperfect when the subject-matter absorbs thought and attention. Take, for illustration, the notebooks of students, or even of teachers at institutes or summer schools. The attention of the note takers is absorbed in the lesson or lecture and the points worthy to be noted, and as a result little thought is given to expression or the correct use of written

Careless Written Work.

forms, as the notebooks plainly show. It is evident that such practice can contribute little to one's skill and accuracy in the use of written language. These facts suggest that the written work required of pupils, especially in elementary schools, should be kept within the limits of *careful writing*. An excessive early use of writing as a "tool" dulls the tool and lessens the probability of its skillful use in college or adult life.

Careful Writing Necessary.

These and other reasons that need not be stated show that the art of language should be given a regular place in the daily program of the elementary school, and that the training therein should be as systematic and skillful as in any other branch. To this end, these language exercises cannot be tethered to exercises in other studies. They must have an aim and a progress of their own. It is true that there are lessons in several school studies that afford excellent material for an exercise in expression, oral and written.[1] It is fine training for pupils to put what they have learned on any subject into the best possible English; but, to attain this result, their attention must be focused on the expression, and not on the knowledge to be expressed.

Language should have Regular Place in the Program.

As a further introduction to the more fundamental study of language training, which is to follow, it may be suggested that, for this training, the twelve years of school may properly be divided into *two equal periods of six years each*. The first six years are to be devoted to synthetic training in the art of language; and to this training are to be added,

Division of School Period.

[1] The use of written language should have a small place in number exercises. The analysis of problems should be *oral*.

during the next six years, the study of English grammar, rhetoric, and literature. As is seen, this scheme postpones the study of technical grammar, or the science of language, to the *seventh* school year. Experience fully shows that this is sufficiently early to begin a study that belongs to the same school period as algebra. When the study is begun, it should be taught in a scientific manner. All mixing of unrelated exercises should be avoided.

Place of Technical Grammar.

In the old régime the chief reliance in teaching language above the third school year, reading and spelling excepted, was English grammar; and the chief aim of grammar instruction was to give pupils a knowledge of the classification of words, the structure of the sentence, and the relation of words therein. The means to these ends were definitions, rules, parsing, and analysis, and later the correction of "false syntax." This study of technical grammar was spread over a period of four to five years, being often begun as early as the fourth school year.

Grammar in the Old Régime.

As a means of preparing pupils to pass examinations in grammar, this training answered its purpose reasonably well, especially when the tests were grooved to the text-book and did not call for the exercise of much judgment or analytic power. The most satisfactory results were attained during the last two years. But the more thoughtful and observing teachers began to realize that this grammar drill, whatever its value in other directions, was not giving pupils promised skill in the use of language. The fact slowly dawned that it is not the function of English grammar "to teach the art of speaking and writing the English language with propriety," as taught by Lindley Murray,

Language Results of Grammar Drills.

an error fully disclosed by Professor Whitney in the preface to his "Essentials of English Grammar."

It is conceded that the study of English grammar *at the proper age* has great value as a means of training the analytic judgment, of developing the power to interpret language, and of establishing a standard for the correction of errors in one's own speech and in that of others; but it has little or no help for the young pupil in acquiring the art of expressing with facility what he knows, the one important result of language training the first six years of school. English grammar has an important function in school training, and no other study can take its place.[1] But it is not a child's study. "As grammar was made after language," says Spencer, "so ought it to be taught after language."

Value of the Study of Grammar.

There are those who appeal to their own experience as proof of the correctness of Lindley Murray's conception of the function of grammar, but they fail to note that whatever advantage in speech came to them from the study of English grammar appeared in *adult* life. The writer is indebted to Lindley Murray and Kirkham for some of his little skill in the use of correct English, but this help came to him from the study of grammar after he was sixteen, not in childhood.[2]

Appeals to Experience.

[1] "Grammar is the form that logic assumes in the interpretation or construction of language, and so is the only strictly logical study with which most persons who attend school ever form a practical acquaintance." — HINSDALE'S "The Language Arts," p. 159.

[2] "Grammar has its part to contribute, but rather in the higher than in the lower stages of the work. One must be a somewhat reflective user of language to amend even here and there a point by grammatical reasons, and no one ever changed from a bad speaker to a good one by applying the rules of grammar to what he said." — W. D. WHITNEY in "Essentials of English Grammar."

Ends and Principles.

We now squarely face the definite question, What should be the nature of language training during the first six years of school? In seeking a practical answer to this question, let us consider (1) the ends to be attained by such training; (2) the principles that must be observed; and (3) the materials and methods to be used. Fortunately, modern school experience sheds a clear light on each of these points.

Nature of Language Training.

1. Ends to be Attained.

In no other branch of study is a knowledge of the ends to be attained more important than in language, and in no other branch is a wrong end more subversive of effort. English grammar, as heretofore intimated, was long taught under the delusion that its mastery gives the learner skill and accuracy in the use of language, and this was often held out as an enticing reward for its early study. When the so-called "language lessons" supplanted grammar in the lower grades of school, the majority of teachers looked upon these lessons as simply a new method of teaching grammar, and grammatical accuracy in speech and writing was still made the conscious end of effort. Pupils were drilled in the recognition of "action words," "object words," "quality words," "relation words," etc., with later drills on the number and case forms of nouns and pronouns, the active and passive forms of verbs, with exercises in changing and patching sentences, in filling blanks, in putting given words into sentences, etc.; and the aim

Grammar Delusion.

Language Lessons.

of all this patchwork was to introduce the pupil to English grammar, and thus to guard him against the use of false syntax.

Moreover, authors kindly came to the assistance of teachers in the new method of teaching grammar. Nearly every author of a text-book on grammar wrote an introductory grammar with the specious title of "Language Lessons." The general plan of most of these numerous manuals is essentially the same. They present a recurring series of cut-feed lessons in grammar, with just enough real language work to make the deception complete. They begin with exercises in patching sentences, filling blanks, etc.; next pass to drills in "simplified" grammar, and then give a little synthetic work; and thus sentence twisting, diluted grammar, and composition are mixed to the end of the dreary course.

Language Lesson Manuals.

It is thus seen that even the so-called language lessons in the schools have widely faced grammar; and, so far as they have touched the art of language, their central aim has been *to secure grammatical accuracy in speech and writing*. Whatever may be true of the grammar results of these lessons, they have failed to give satisfactory skill in the art of expression. What is needed is to turn language training in elementary schools right about, and make it face, not grammar, but facility in the practical use of language as a means of expression.

Language Lessons to face Facility.

The first and chief end to be attained in elementary language training is:

I. Facility in the expression of one's knowledge.

The new word in teaching the art of language, which needs "to be writ large," is FACILITY. The coveted

end of such training is the facile expression of what one knows and feels and wills, and this includes *clearness*, *force*, and, increasingly, *elegance*. Grammatical accuracy is picked up by the way. It is the result of example and imitation, and hence cannot be directly taught a child. "Good habits of speech are caught rather than taught," says Professor March, our great English scholar. "The normal child," says Dr. Hinsdale, "who is accustomed to good English, and nothing else, uses good English."

Facility First End.

But the pupil is also to learn the art of expressing his knowledge *by writing;* and this involves spelling, the use of capitals, punctuation, the use of quotation marks, paragraphing, etc., that is, the skillful use of the *written forms* of language. It is to be specially noted that the attainment here needed is not simply a knowledge of these written forms, but *skill in their use*. It follows that the second important end to be attained in language training is:

Skill in Use of Written Forms.

II. **Skill in the use of the written forms of one's mother tongue.**

It is thus seen that the two fundamental ends to be attained in language training in elementary schools are: (1) *facility in the expression of one's knowledge*, and (2) *skill in using written forms*. Other results may be important, but these are fundamental and essential.

The Two Guiding Ends.

2. Principles to be Observed.

How can these ends be attained? This inquiry brings us back to the fundamental question, *How can power and skill be trained?* This question is fully answered in the second and third laws of teaching (pp. 39, 48).

The several powers are trained only by occasioning their appropriate activity, and each power is trained by its own activity; not by the activity of another power. It follows from these principles that analytic power is trained only by analytic activity and *synthetic power only by synthetic activity.*

Laws of Teaching.

But speech and writing are synthetic processes, not analytic, and hence the art of language can be trained only by *synthetic activity*, that is, by the expression of one's ideas and thoughts in words. What is true of oral expression is equally true of written. Skill in the use of the written forms of language is not acquired by learning formal rules, but by actual practice in writing the mother tongue.

Art of Language trained only by Synthetic Activity.

We thus reach the one guiding principle in language training, to wit:

The art of language can be acquired only by practice in the expression of one's knowledge under guidance and stimulation.

Both reason and experience attest the correctness of this principle. All experience shows that skill in the use of language is acquired only by continued and progressive practice in the clear and forceful expression of what one thinks and feels.

It follows that language exercises in elementary schools should be *synthetic*, affording pupils fruitful practice in the expression of their thoughts and feelings. Exercises in which pupils repeat the expression of another's knowledge contribute little to their ability to express their own knowledge. The first and essential requisite in the expression of knowledge is a clear grasp of the knowledge to be expressed. The pupil who knows nothing

Language Exercises should be Synthetic.

cannot come into either power or skill by attempts to say it! "Language and thought are one," says Max Müller. Certainly, the possession of knowledge is essential to its expression.

The first step in language training is to help the pupil to knowledge to express, and hence every elementary lesson in language is primarily a knowledge lesson. The next step is the expression of the knowledge acquired. This touches the weakness of the language work in many schools. It requires the expression of knowledge in the absence of knowledge to express, and is thus a parallel of the folly of the Egyptian taskmaster who required bricks to be made without straw. More than half of the teacher's efforts in language lessons in primary schools should be given to the developing of the ideas and thoughts to be expressed. Knowledge clearly grasped begets an impulse for its expression. Clearness and fullness of knowledge make clear and full expression possible.

First Step Knowledge.

CHAPTER XVIII.

LANGUAGE TRAINING (*Continued*).

MATERIALS AND METHODS.

THE training in language the first two years, particularly the first year, has been quite fully indicated in the preceding chapter. It remains to consider the nature of language exercises to the sixth year inclusive, and the methods of training to be used.

These language exercises should not only be daily, as already shown, but they should also be as *well graded* and as *progressive* as the lessons in arithmetic, or any other branch. They should increase in fullness and scope from year to year, new elements being introduced as pupils acquire the power to use them. One of the common faults of much language work is its continuance on a dead level, pupils in the second year being given nearly the same exercises as those in the fourth or fifth year. It is not possible to sustain interest in the same language work from year to year. Pupils must be conscious of progress in any art, and this is eminently true in the art of expression.

Language Exercises Progressive.

The exercises in language must also afford a *needful variety of practice.* A true language course embodies each year all the fundamental disciplines in expression. The best school experience shows that there are five series of exercises that most fully meet this condition. These are *Observa-*

Five Series of Exercises.

tion exercises, *Picture* exercises, *Story* exercises, *Letter* writing, and *Dictation* exercises; the first four being synthetic, and the fifth teaching the written forms of language by example. There are other language exercises that have value, but the five series given above afford the several disciplines in language most needed and most fruitful in the lower grades of school. Their practical value has been widely attested.

Division of School Year into Four Periods.

These different series of exercises may be so correlated each year as to afford desired variety of practice, and, at the same time, to give the best possible training in each series. This is accomplished by dividing the school year into four equal periods, and then devoting the first period to observation exercises, the second to pictures, the third to stories, and the fourth to letters. Dictation drills to impart skill in the use of written forms may be interspersed throughout the year as needed. Several weeks each year, not necessarily in succession, may profitably be devoted yearly to these exercises in dictation.

Advantages of Four Periods.

One advantage in the division of the year among the four synthetic series, as suggested above, is the opportunity thus afforded to both teachers and pupils to acquire a fair degree of skill in one series before turning to another. There are few teachers who can give lessons in all these series in a miscellaneous way, a lesson to-day on a flower, to-morrow on a picture, the next day on a story, and so on. The experience of Cincinnati and other cities shows that it requires about two months for most teachers to become reasonably skillful in presenting any one of these series of exercises. The same is true of the pupils. It takes them several weeks to acquire a fair degree of

skill in any one series as given in a grade. Of course a year's practice in one series would give higher skill than two months' practice, but continuing in any one series for a year would be attended with a serious loss of interest, and a sacrifice of needed variety of discipline. The best results, the entire course considered, are attained when pupils turn from one series to another every eight or ten weeks. The interest is thus readily sustained, and each year affords training in all of these important disciplines — a training that rises in difficulty from year to year.

Needed Skill thus acquired.

The outline on the next page presents a course of synthetic exercises in language that embodies the foregoing suggestions.

It will be seen from this outline that each year is divided equally among the four synthetic series, the first being devoted to observation lessons, the second to pictures, the third to stories, and the fourth to letters. The exercises in each series rise from the second year to the sixth inclusive, those in the fourth year being fuller than in the third, and those in the sixth year fuller than in the fifth.

Explanation of Outline.

The character of the exercises in each series will be made plain by a brief description, with suggestions as to methods of presentation.

Character of Exercises.

1. **Observation.** — The observation lessons for the second year may be devoted to common objects, to actions observed by the pupils, etc. The facts observed by the pupils are first expressed orally, pains being taken to secure good expression, and the sentences as reached are written by the teacher on the board in one paragraph. The written exercise may then be read, the spelling, capitals, etc., noted, and then be

Object Lessons.

SYNTHETIC EXERCISES IN LANGUAGE.

PERIODS.	EXERCISES.	FIRST YEAR.	SECOND YEAR.	THIRD YEAR.	FOURTH YEAR.	FIFTH YEAR.	SIXTH YEAR.
First.	OBSERVATION.	Simple exercises in talking; conversation; telling brief stories; observation lessons, etc. Oral expression prominent; little written work, chiefly in reading exercises. Writing sentences, and, near close of year, brief paragraphs.	Common objects; actions observed, etc.	Animals and Plants.	Animals and Plants.	Descriptions from Questions.	Descriptions from Questions.
Second.	PICTURES.		Simple Description of Pictures.	Description of Pictures, with addition of what may be imagined.	Description of Pictures, with addition of what may be imagined.	Stories based on Pictures.	Stories based on Pictures.
Third.	STORIES.		Brief Stories from Memory.	Reproduction of Stories.	Reproduction of Stories.	Stories from Outlines.	Stories from Outlines.
Fourth.	LETTERS.		Simple Notes and Letters.	Complete Letters.	Complete Letters.	Business and Social Letters.	Business and Social Letters.
	DICTATION.		Dictation exercises throughout the year to teach the *written forms* of language, as spelling, capitals, punctuation, abbreviations, quotations, etc. They may begin with words and sentences and pass to paragraphs containing questions, common abbreviations, quotations, etc.				

NOTE. — In the seventh and eighth school years, the written exercises in composition (weekly?) may include (*a*) descriptions of journeys, real or imagined; (*b*) current events, natural phenomena, etc.; (*c*) narratives of personal experience, real or imagined; (*d*) biographical and historical sketches; (*e*) simple essays, etc.

copied by the pupils on slate or paper. By comparing their written exercises with the teacher's on the board the pupils will see their errors. The paragraph on the board should now be erased or covered and then be rewritten by the pupils.

In three or four weeks the pupils will be able to tell, at the close of the oral exercise, all the facts observed, and then to write the same on slate or paper, the teacher now writing the exercise on the board for comparison of the pupils' written work. Care should be taken to lead the pupils *to tell well* the facts learned, and all new words should, as they occur, be written on the board, the aim being to secure correct spelling from the first. After its correction by comparison the exercise should be rewritten by the pupils. The exercise should be written in a paragraph, and words at the end of a line should, when necessary, be "divided on a syllable." These first steps in the use of written forms should be very carefully taken.

The Written Exercise.

The observation lessons of the third and fourth years are properly devoted to the study of animals and plants, the animal or plant studied being in some form present. These lessons may be so arranged as to give pupils an intelligent introduction to the study of nature. The pupils should not be asked to write what they cannot tell well, and so special attention should be given to proper oral expression of the facts learned, singly and finally together. All new words should be written as they occur on the board, and care should be taken to avoid the use of many scientific terms. The facts of *common* observation, rather than scientific, should constitute these lessons. The written work of the pupils should be corrected

Nature Lessons in Third and Fourth Years.

in the time set apart for the language exercise, and chiefly by means of one or two of the pupils' exercises reproduced on the board. After correction the exercise should be rewritten with care by the pupils, and then again rewritten if this be necessary to secure desired excellence. The lessons in the fourth year may be more extensive than those in the third year.

Fifth and Sixth Years.

The exercises in this series for the fifth and sixth years are based largely on prior observation and experience, and relate to objects or phenomena more or less known by the pupils. The study of the objects desired is indicated by questions dictated or written on the board, and copied by the pupils. Suppose, for example, that the object to be described is *snow*.

An Example.

The facts to be known and expressed are indicated by say eight or ten questions arranged in proper order. The answers to these questions are to be prepared in writing and brought to the class at the next period for review. So much of the time as may be necessary is devoted to a study of the pupils' written answers, with special reference to the accuracy of the facts given and the manner of their expression. If this review be properly conducted, the pupils will know many facts about snow, and will have had helpful training in their clear expression. They are now prepared to write an intelligent description of snow.[1]

Correction of Papers.

The next period may be devoted to the correction of the written papers, and this may be done as previously indicated, or by the review of one or more papers with pupils in groups observing the same. The purpose of this criticism by the teacher is

[1] It is believed that "Brookfield's Composition" first presented this method of teaching composition to pupils who have had little practice in writing.

not so much to perfect the present papers as to enable the pupils to be more accurate and skillful *in the next exercise*, the true object of all correction of the written work of pupils. The subjects of rain, dew, frost, fog, clouds, day and night, change of seasons, winter, summer, fall, spring, harvest time, etc., will afford other interesting exercises.

2. Pictures. — Children like to see pictures and talk about them, this being especially true when their efforts at talking are encouraged and helped. The question, "What does Eddie see in the picture?" is sure to focus sight and unloose the tongue. Pictures appeal not only to the eye, but also to the imagination, and hence are a source of unfailing delight to children. They are the charm of nursery prints and the primer, and contribute much to the enjoyments of child life. Not only do pictures give pleasure, but their study trains the power of observation, kindles the fancy, and cultivates a taste for the beautiful. They also stimulate expression, and afford admirable material for its training. These facts explain the prominence given to pictures in elementary courses in language.

Pictures as Language Lessons.

The use of pictures the first school year should be free and varied. They may be made the basis of exercises in conversation and reading, and in various ways may enter into other exercises. In the second year they may be used in a more definite manner. The first aim now is to teach pupils *to see a picture*, to see first what is essential and then the related details. This observation is readily directed by questions, and in a few weeks young pupils will acquire a good degree of skill in seeing pictures. The facts thus learned, told in proper order, constitute

Use of Pictures First Two Years.

a simple description of a picture as *an object of sight*. The tendency of children to read their fancies into pictures should not be encouraged until they have acquired fair skill in seeing what is actually represented.



When the pupils have acquired reasonable facility in telling what they see in a given picture, they should then write the same on slate or paper. If all new words are written on the board when used, there will be few misspelled words in the written exercises. As a means of correcting errors, the teacher should write the exercise as a paragraph on the board, writing sentence after sentence as given by the pupils, special attention being given to margins, spelling, capitals, punctuation, division of words at end of line, etc. When a comparison of the pupils' work, under the

Written Exercises.

teacher's guidance, has been made, the exercise on the board should be erased or covered, and the exercise rewritten by the pupils. Care should be taken in the selection of pictures. Chromos will be found preferable to prints in this grade.

In the third and fourth years pictures should be used that appeal to the imagination, and their study made to include not only what is seen by the eye but also what the mind sees. To simple description will thus be added what may be imagined,

Third and Fourth Years.



and this will give new interest to the study and increased facility, and elegance to expression. The imagination, as well as the observation of the pupils, may be guided and stimulated, and the exercise may thus have unity. Needed practice in oral expression should precede the written exercise. This should be corrected as indicated under observation lessons (p. 227), and the reviewing of the exercise should help secure accuracy and skill in the use of written forms.

In the fifth and sixth years pictures may be made the basis of stories in which the imagination has free play. The effort of the pupils is not simply to see the picture but *to read or interpret it.* The facts now to be expressed are those which the mind sees in the picture, and experience shows that the imagination readily responds to skillful training. The

Fifth and Sixth Years.



pictures used for the purpose should be those that tell a story; and in the fifth year the story told should be obvious.

The picture above was once given as a test exercise to several thousand pupils of the sixth grade. They were asked to write a story suggested by the picture, and to locate the scene where there are pine forests and much

snow in winter. Thirty minutes were allowed for the study of the picture, noting the outlines of the story, etc., and then one hour was given for the writing of it. The result of the test was gratifying evidence of the pupils' attainments.

Stories. — The story has a prominent place in the modern primary school. It has special value as a means of training the power of expression. To this end, it is not enough that stories are told or read to children; *they must be told by them.* In the first school year, the pupils should learn a few choice stories by heart, and be trained to tell them well. If the stories are properly selected, taught, and used, they will increase the children's vocabulary, and add to their facility in talking. It is, however, a mistake to tell young children too many stories. When a story is well learned, it may be written neatly on the board and used as a reading lesson, much to the delight of the little ones.

Stories in First Year.

In the second year, the pupils should not only tell the story, but, when this can be done well, they should write it as neatly as possible. This is an excellent way to teach the written forms of language. All new words in the story should be written on the board as the story is learned. At first it may be well for the teacher to write the story on the board, calling attention to the spelling, use of capitals, punctuation, and other written forms. The story on the board may be erased or covered, and then be written by the pupils on slate or paper. The pupils' story may now be compared sentence by sentence with the story on the board, and then be rewritten by the pupils. It is easy to awaken in children a lively interest in this writ-

Second Year.

ten work, with increasing skill in the use of written forms.

Special care should be taken in the selection of stories thus to be memorized. They should be worthy of a place in the child's memory. Several of the stories memorized and repeated the first year and used as reading lessons, may be used as a language exercise in the second year. In two months as many as ten stories may be used as written exercises.

Selection of Stories.

In the third and fourth years, the stories read or told by the teacher are *to be reproduced by the pupils.* The brief story is first to be told or read by the teacher in the most interesting manner possible, and the pupils are called upon to give, in answer to questions, the name of the story, the first incident, the second, the third, and so on, until the story is reproduced. One or more pupils are then called upon to tell the entire story; and, when this can be done well, the pupils write it on slate or paper. No two of the pupils will use precisely the same words, but all will reproduce the story with a fair degree of accuracy. One or two of the pupils' reproductions may be copied by them on the board, and used for the correction of the written work of the class.

Reproduction by Questions in Third Year.

In the fourth year stories may be reproduced in writing without the oral reproduction by incidents, as in the third year; but it will usually be wise to tell or read the story more than once. It requires a degree of attention and memory rarely possessed by young pupils to reproduce a story, even a very short one, on hearing it only once. Besides, nothing is gained by overforcing the attention at

Reproduction in Fourth Year.

so early an age. The reproduction of stories may be made a most efficient training in expression, and especially in acquiring skill in the use of written forms.

In the fifth and sixth years stories may be written from analyses or outlines which suggest the main incidents. Care must be taken to select stories not already known by the pupils, but it is not necessary that the stories be original. Literature abounds in choice stories that may be used for the purpose. The outlines may be written in sentences or may be largely expressed by words and phrases. A little practice will enable a teacher to prepare these outlines intelligently. They afford pupils most excellent training in the invention of details as well as in writing a story in choice language.

Stories from Outlines in Fifth and Sixth Years.

The following analysis of a fable was used by the late Professor T. E. Suliot, formerly of Paris, who in his day was a very skillful teacher of English composition. It was given to a class of students in a preparatory school:

Professor Suliot's Outline.

1. During the reign of the Emperor Augustus a dolphin formed an attachment for a boy, the son of a poor man.
2. The boy fed the dolphin with bits of bread.
3. Every day the dolphin swam to the surface of the water.
4. The dolphin was called by the boy and received his usual meal.
5. The dolphin is said to have carried the boy on his back from the seaport to a school in Puteoli, bringing him back in the same manner.
6. After a time the boy grew sick and died.
7. The dolphin came daily to the usual place, but missed his kind companion.
8. The dolphin died of grief.

The following outlines of a story were given as a test exercise to about three thousand pupils in the sixth grade in the Cincinnati schools:

THE FORGIVEN DEBT.

Boston merchant; much business with Cape Cod fishermen; fishermen often have bad luck; not able to pay debts.

Merchant dies without will; three sons; the elder made administrator; finds among his father's papers a package of unpaid bills, with written request that they be burned. Meeting of brothers; they agree; make a list of the debtors; burn the bills.

Old fisherman calls at elder brother's office; wishes to pay a debt long since due; saved a little money each year; has now $500.

The son looks over list; finds the old man's name; tells him debt is canceled; fisherman begs to pay at least a part; son will take nothing.

Old fisherman's gratitude; returns home with light heart; joy in family.

Letters. — The ability to write a well expressed and neatly written letter is a very important acquisition, one that should receive careful attention in school training. The fact that many pupils leave school before the sixth school year makes it important that early training in letter writing be provided. As early as the close of the fourth school year, pupils as a class should be able to write a creditable letter. It is true that this will require much instruction and practice, but this is just the training which the school should provide.

Importance of Letter Writing.

Training in letter writing should begin with the writing of simple notes, first without date and later with date, and, as early as the third school year, it should pass to the writing of complete letters.

Series of Exercises.

For full directions as to the teaching of letter writing, the reader is referred to manuals on the subject.

It must suffice to say that special attention should be given to the dating, salutation, signing, folding, addressing, etc.; and, what is even more important, to the subject matter. The writer of a letter should have something to write, *a message to communicate;* and this will often need careful development. A letter is a pen talk with another person, and as such it affords an opportunity for the free and natural expression of one's thoughts and feelings. The letter is the simplest of original written productions. Suggestions.

In the fifth and sixth school years attention is properly given to social and business correspondence. Some good material for business letters and papers will be furnished by the exercises in arithmetic.

Dictation. — The object of these exercises is to make pupils familiar with the written forms of English and skillful in their use. In the sixties General Garfield and the writer listened to an institute lecture in which some fifteen rules of spelling were presented and illustrated. At the close of the lecture, the General turned and said, "That is interesting as information, but did any one ever learn to spell by rule?" Certainly no child ever thus learned to spell, and what is true of spelling is true of the use of capitals, punctuation points, abbreviations, quotation marks, and other written forms. It is in the continued and progressive *use* of these forms that pupils come to know them and to be skillful in their practical use in writing. Dictation Exercises.

The language lessons, heretofore sketched, afford pupils much practice in the use of English written forms, but this practice can readily be increased in efficiency by the wise use of dictation exercises. One advantage of these exercises is the Advantages.

repetition of the more common forms which may thus be secured. The exercises may also be so graded as to introduce one form after another, thus furnishing needed practice and reaching desired skill. One dictated exercise a week for four years would, if properly graded, make elementary pupils familiar with the more common written forms of English.

When the dictated exercises are written by the pupils, they should be written on the board as models for comparison in the correction of the pupils' work. To save time in class, the exercises may be written in advance on the board and covered, or, what is better, may be written on sheets of paper of suitable size. After correction the exercises should be rewritten by the pupils to attain desired accuracy.

Correction of Exercises.

We give below a few exercises as examples of the dictation work that may be made a part of language training. These exercises are suitable for fourth and fifth year pupils; and, the last possibly excepted, may be used as early as the third year.

Examples.

CLEVELAND, O., Nov. 22, 1900.

MY DEAR MOTHER: — We had a very pleasant ride on the cars, and reached the Union Station at 4 o'clock. Uncle Calvin met us at the train and took us home in his nice carriage.

Most lovingly,

KATE.

"Aunt," said little Grace, "I have found a new key to unlock people's hearts." "What is this new key?" asked her aunt. "It is," said Grace, "only one little word, *please*."

A countryman at a hotel helped himself to his neighbor's melon. "That's cool," said the man. "Yes," said the countryman, "it must have been on ice."

Noah Porter, D.D., LL.D., ex-president of Yale College, was the editor of "Webster's Unabridged Dictionary." Doctor Porter is the author of the so-called "Webster's Condensed Dictionary," an excellent dictionary for the schoolroom.[1]

The Rural School.

It may properly be objected that the foregoing scheme of language training with six classes is not practicable in ungraded schools. In graded schools in cities and towns with one or, at most, two classes in a room, there is time for this important work, and it may be done in a satisfactory manner; but it is clearly not possible for the teacher of an ungraded rural school to conduct daily five or more language exercises in addition to those in other branches. But the pupils in rural schools sadly need this training in language, and some way must be found to give it. We venture to submit a few suggestions which have been attested by the experience of many teachers.

Language Training in Rural Schools.

1. There should be no attempt in a rural school to teach writing (penmanship), language, and drawing to six or more separate classes. In any school term only three grades of practice in each of these arts is necessary. The same is true of vocal music.

Plan.

2. For the teaching of these arts, let the pupils of the rural school be divided into three sections, to wit: *Primary*, including say first and second year pupils; *Secondary*, including third to fifth year pupils; and *Advanced*, including all pupils above the secondary. These three sections correspond to the three school departments in a district which contains a suffi-

Three Sections.

[1] In dictating this exercise say, "Noah Porter, doctor of divinity, doctor of laws," etc., and require the pupils to write the abbreviations.

cient number of pupils to employ three teachers, — one for the primary classes, another for the secondary, and a third for the more advanced.[1]

3. Let one period daily be devoted to the arts of language and writing, — three periods each week being given to language and two to writing; say Monday to language, Tuesday to writing, Wednesday to language, Thursday to writing, and Friday to language. If necessary, three periods each week may be given to language, one to writing, and one to drawing.

Division of Time.

The reader may not see how three sections or classes can be taught writing or language in the same period, but experience has solved this difficulty, and many teachers are doing it successfully. Take, for illustration, writing. The pupils in the advanced section will need most time for practice and those in the primary section the least, and so attention may be first given to the advanced section. Some five minutes of instruction will be sufficient to prepare the pupils for practice, and five minutes more will suffice to instruct the pupils in the secondary section. Needed attention can now be given to the primary section, leaving ten to fifteen minutes for their practice. The remaining time can be devoted to an inspection of the work in the several sections, the correction of observed errors, the giving of needed assistance, etc.

Explanation of Plan.

A like course can be pursued in language, though the development of the knowledge to be expressed may require more time than is allowed above for preparatory instruction in writing. It is not necessary, however,

[1] For a full description of this division of a rural school into three sections, see White's "School Management," pp. 86–94.

to develop the three lessons in the same period. The lesson developed orally to-day may be written by the pupils in the next language period. One section may at the beginning of a period rewrite a lesson corrected in the previous exercise, and so on. The ingenious teacher will find ways to keep three classes of pupils busy with profitable language work during the same period.

4. The language exercises may be divided among the three sections as shown in the following outline:

PERIODS.	EXERCISES.	PRIMARY.	SECONDARY.	ADVANCED.
First.	OBSERVATION.	Common objects; actions observed, etc.	Animals and plants.	Descriptions from questions.
Second.	PICTURES.	Simple description of pictures.	Description of pictures, with addition of what may be imagined.	Stories based on pictures.
Third.	STORIES.	Brief stories from memory.	Reproduction of stories.	Stories written from outlines.
Fourth.	LETTERS.	Simple notes and letters.	Complete letters.	Business letters and papers, social notes, etc.
	DICTATION.	Dictation exercises throughout the year to teach the *written forms* of language, as spelling, capitals, punctuation, abbreviations, quotations, etc. They may begin with words and sentences, and pass to paragraphs containing questions, common abbreviations, quotations, etc.		

NOTE. — For exercises for the first year and compositions for advanced pupils in grammar classes, see outline on page 226.

CHAPTER XIX.

ARITHMETIC.

First Lessons in Number.

In no other school art is philosophy less helpful to the teacher than in the primary lessons in number; and yet nearly every new method of teaching number is heralded by the claim that it has a sure philosophic basis. This is an old trick in pedagogy, one that has been used in exploiting new methods and devices in nearly every branch of instruction. While the ordinary teacher gets no clear conception of the principles proclaimed, he supposes that they must rest on bed-rock philosophy, and so gives a willing ear to the new method which promises to revolutionize the teaching art. In recent years much stress has been laid on the genesis and nature of number as the basis of a true method of teaching number to children. Fortunately, these facts fall in the domain of observation and experience, the chief function of philosophy here being to expose assumptions made in its name.

Philosophy and Number Methods.

In another place we have fully discussed these questions,[1] and it must suffice here to say that the ideas of number first in the mind of the child and the race answer the question "*How many?*" They are occasioned by the phenomena of nature, or,

First Number Ideas.

[1] "The Early Teaching of Number as Ratio," American Book Company, New York.

if preferred, by environment and subjective experience. The mind discriminates between one and more than one, and the idea of number arises.

There is nothing in the child's environment or experience that justifies the claim that the first ideas of number are occasioned by the measurement of concrete magnitudes. There are not in all nature as it touches the child any two visible objects whose quantitative equality or ratio can be determined by observation, and certainly all subjective or psychical phenomena have no quantitative relations. Moreover the quantitative measurement of concrete magnitudes is not possible until artificial devices for such measurements are invented and used. These facts show that number ideas cannot have their origin in quantitative measurement, and that the numbers first in the child's mind do not and can not express quantitative relations. The child's first number ideas not only denote how many, but they are applied to numerous objects that have no quantitative relation. Hundreds of objects first numbered by the child have no such relation. The expressions "three children," "three horses," "three leaves," "three stars," etc., do not involve the idea of quantitative equality. The children may be of unequal ages and the horses, leaves, and stars of unequal sizes. Indeed, not even space relations enter necessarily into the child's ideas of number, for these ideas often relate to subjective phenomena and other objects that have no space relations. Speaking more technically, the child's first ideas of number are qualitative, not quantitative. All objects that have qualitative similarity may be numbered. These facts prove beyond question that the first number ideas of the child and the

Not occasioned by Quantitative Measurement.

race denote *how many*, and are not ratios. The idea of ratio is later, and is, as Dr. McClellan asserts, "the result of development."

It is an error to assume that the mind cannot discern the relations between numbers without sensing or imaging corresponding concrete magnitudes. The mind that cannot discern that there are three 2's in 6 or that 2 is one third of 6 without imaging concrete magnitudes that correspond to 2 and 6 is in the infant phase, or is near the dunce condition in number power. Moreover, the sensing or imaging of numbers has at most a very limited possibility. It is true that a little training will enable the infant mind to image from one to ten objects readily; and, by grouping, a few numbers above ten may be imaged, but this imaging of numbers soon reaches its limit as well as its utility. Besides, it is not possible for the mind to image even denominate numbers that denote time, force, energy, and other non-space quantities.

Sensing Numbers.

Further, the habit of imaging numbers in corresponding concrete magnitudes is a serious obstacle in acquiring a true knowledge of numbers. In Galton's "Inquiry into the Human Faculty," examples are given of persons who have the habit of *visualizing* numbers. When, for example, the number seven is in the mind, the ghost of the figure 7 arises in the mind's eye, and in some instances in a certain place in the field of vision. This abnormal habit is not much more undesirable than the habit of imaging certain material objects as the symbols of numbers. The pupil who reaches the fourth school year unable to compare numbers without first imaging corresponding magnitudes is in an almost hopeless number condition. To such a mind

Habit of imaging Numbers.

the rapid and accurate addition, subtraction, multiplication, and division of numbers are not possible. This is not a case of "arrested development," for there has been no true number development to arrest. A child, if properly trained, early acquires the power to discern and compare numbers without imaging concrete objects to represent them. It is a serious mistake to assume that children are number dunces.

These facts justify an earnest caution against the making of the measurement of concrete magnitudes too prominent in early lessons in number. Such measurements have a place, especially in dealing with denominate numbers, but they should not be made the *basis* of number training. It is true that exercises involving the manipulation of geometrical blocks, the foot rule, the pint cup, etc., may be made very showy, and, it may be added, very deceptive. The limited number of comparisons possible may be repeated over and over until the pupils outdo those earlier number prodigies who, by their feats in the mental analysis of problems, so astonished the old-time teachers. Whatever may be the value of such exercises in the actual measurement of magnitudes, they have small value as a preparation for the higher phases of arithmetical instruction or, indeed, for practical life. Nine tenths of the pupils in our schools will give only a small fraction of their time in after life to the use of the yardstick or the balance, and those whose life work involves the arts of measurement will use a more certain process than inspection.

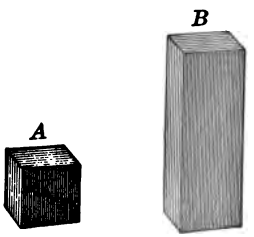
Caution.

Deceptive Number Exercises.

This suggests the fact that it is not possible to ascertain the exact ratio between two concrete magnitudes by observation or inspection, or, speaking more accu-

rately, to find the ratios of the numbers which represent such magnitudes; for the good reason that it is not possible to find two numbers that will *exactly* represent the magnitudes. For example, it is not possible to ascertain by inspection the exact ratio of the solid A to the solid B. It may be seen that B is *about* 3 times as large as A, and hence that A is equal to *about* one third of B. It is clear that there is no quantitative accuracy here. Besides, the error in teaching that the solid A is one third of the solid B is obvious for, being *separate* concrete magnitudes, A is no part of B. The most that inspection can disclose is the fact that the magnitude A equals about one third of the magnitude B. This may be an *approach* of the mind to the idea of exact ratio, but it is not the way in which the mind reaches such an idea.

Ratio of Concrete Magnitudes not measured by Observation.



It is thus seen that the methods of teaching number to children should not deal exclusively with concrete numbers, and especially with numbers represented by measured magnitudes. They should also train the mind in the easy grasp of abstract numbers, and give facility in discerning relations between such numbers. In no other study is it more important "*to unsense the mind.*" The initial steps in teaching numbers and number processes include: (1) numbers represented by groups of objects in sight (objective); (2) numbers represented by objects not in sight, but easily imagined or imaged; and (3) numbers not applied to sensible objects, that is, the so-called abstract num-

The Three Initial Steps.

bers. These three steps may be taken in the same exercise or in different exercises.

In the first year the emphasis is properly placed upon *objective* exercises. In these exercises a variety of objects should be used, and uniformity in the manner of presenting them avoided. Care should be taken not to continue these objective exercises too long. It is possible to keep young pupils numbering, combining, separating, and comparing objects in sight so long that it is not easy to unsense their ideas of number, to secure their easy apprehension of number without reference to visible objects.[1]

Objective Exercises Limited.

Special care should be taken from the first not to confound numbers and objects. "Show me the number three," says the teacher, and a pupil holds up three fingers, thus probably confounding the group of fingers and the number three. Such a direction should be avoided. It is not the group of fingers that is the number three, but the *threeness* of the group, the *how many* fingers in the group. Care should also be taken later not to confound numbers and figures or other number symbols.

Objects not Numbers.

When denominate numbers are used, and they may be used early, the pupils should be made familiar with the units of measure by their actual use in measuring. The measures may also be used with great advantage in comparing denominate numbers, and in finding what part one denominate number is of

Denominate Numbers.

[1] "The best method is undoubtedly to build up the basic elements from things, but there is great danger in keeping up thinking in things too long in the educative process. However, things should be used whenever they are needed for purposes of illustration or fixing a principle; but the present tendency is to rely on them too much." — Supt. J. M. GREENWOOD, in *New York Teachers' Monograph*, March, 1901.

another, as the part 3 quarts are of a gallon, 4 inches of a foot, etc. But here again care should be taken not to use the visible measures too long. Measurement is not an end of number training, but only a means to an end, and when pupils can compare denominate numbers without the presence of the measures, this should be done. When, for example, pupils instantly discern that 3 days are $\frac{3}{7}$ of a week, and 6 hours $\frac{1}{4}$ of a day, they do not need to inspect a foot rule to see that 4 inches are $\frac{1}{3}$ of a foot. It is a mistake to keep pupils manipulating blocks, foot rules, etc., until visions of these objects fairly haunt their number processes.[1]

Whatever be the objects used in the first lessons in number, pupils should soon pass from objects in sight to those not in sight, also to those that cannot be visualized, as numbers denoting time, and then early, not too early, to abstract numbers. Emphasis would properly be placed upon this last step but for the fact that so many teachers are still using drills on abstract numbers to the neglect of needed objective and concrete exercises, a practice largely due to the fact that drills on abstract numbers are easier than objective instruction. Not only is this true of drills in number, but in all branches it is easier to drill pupils on words and other symbols than it is to teach them real knowledge, a fact sadly illustrated in the memoriter word and figure work which has so long

Drills on Abstract Numbers.

[1] "Teachers should be careful, especially with precocious children, not to continue too long in the use of a process that is becoming mechanical; for it is already growing into a second nature." — Dr. W. T. HARRIS.

"Let it be kept constantly in mind that these things are helps only, and as soon as the child can work without them, they should be cast aside." — Supt. J. M. GREENWOOD, Kansas City, Mo.

characterized school training. Care should be taken, however, to avoid the opposite extreme of exclusive objective training, of keeping young pupils swinging on the gate of sense. No abstract ideas are so early grasped or so easily manipulated by children as those of number, provided always that these are properly approached and taught.

The Primary Course.

There is positive advantage in limiting for a time the first lessons in number to numbers from *one to ten inclusive*. Experience shows that these ten digital numbers can be readily taught to young children by beginning with exercises in numbering, combining, and comparing *groups of objects*, that is, objectively. A child may not at first be able to recognizė at sight the number of objects in a group exceeding three or four, but a few days of skillful training will enable him to number, *without counting by ones*, any group of objects not exceeding ten. Whether this is done by a single perceptive act or by separating the given group of objects into smaller groups and synthesizing these, the act of numbering is practically instantaneous and without a conscious process.[1] Thousands of first year pupils have acquired the power to number instantly groups containing not more than ten objects.

Numbering Groups of Objects without counting by Ones.

This perceptive power is of special value in the first steps in number training. It permits rapid work in

[1] In his experiments at Waltham, Mass., Dr. Thomas Hill proved that children can be trained to number without counting as many as fifteen and sixteen objects properly selected and presented.

combining, analyzing, and comparing groups of objects without counting, and this is essential to the rapid addition and subtraction of numbers as wholes. The habit of manipulating objects by counting by ones must be overcome before pupils can learn to add and subtract the digital numbers *without counting*. The experience of hundreds of teachers has shown that pupils may be trained from the first to add and subtract numbers as wholes.[1] Teachers are not shut up to the alternatives of teaching numbers either by counting or by quantitative measurements of magnitudes.

Special Value of Perceptive Power.

The addition of equal numbers, as three 2's, and the separation of a number into equal parts, may properly be accompanied by exercises to develop the idea of a fraction. These exercises may include the division of an *object*, as an apple or piece of paper, into equal parts, as halves, fourths, thirds, sixths, etc., and later the division of a *group* of objects into equal parts and naming one part, two parts, etc. The common measures, as the foot rule, the yard-stick, liquid and dry measures, geometrical surfaces, etc., may also be used for the purpose. The exercises should pass to the finding of the parts of concrete numbers not represented by visible objects, as numbers denoting time, force, money, etc., and then to abstract numbers. A second year pupil has been badly taught if, at the close of the year, he cannot discern instantly that 1 is one fourth of 4; 2 one half of 4; 2 one third of 6; 3 one half of 6, etc. The fractions

Idea of a Fraction Developed.

Fractional Parts.

[1] For exercises showing how this result may be attained, see the author's "Oral Lessons in Number," a manual for primary teachers; also "Elements of Pedagogy," pp. 294–302.

should at first be expressed by words, and later by figures. Nothing is gained in these early lessons by teaching pupils to add and subtract fractions.

It may be added that number training should not be hurried the first two years of school. The exercises should be simple and natural, and should be kept free of all attempts at logical reasoning and still freer of a logical terminology. The infant has no intelligent use for such terms as "because," "whence," "hence," and "therefore," or the cabalistic sign, "∴". But little should be done, even in the second year, with the factor processes and the factor signs, × and ÷. It is evident that nothing is gained by requiring so young pupils to write out the solution of problems *in words*.[1] The solution of problems at this stage should be oral.

Little Number Training First Two Years.

It is now twenty years since attention was called to the fact that the Grube method is not in harmony with sound mathematical or pedagogical principles. It was then shown that the *part* relation and the *factor* relation of numbers are not identical, and that the processes of addition and subtraction (part processes), and multiplication and division (factor processes) have no such immediate connection as necessitates or justifies the teaching of these four processes together from the first. On the contrary, the factor processes, multiplication and division, naturally and

The Grube Method.

[1] The writer recently saw this exercise in a primary class, first year, the exercise being written on the board by the teacher, and repeated and copied by the pupils:

"Three oranges and four oranges are how many oranges?
Three and four are seven.
Hence three oranges and four oranges are seven oranges."

O that "Hence" for infants!

logically follow the more primary processes of addition and subtraction, and this natural sequence should be observed in the first lessons in number. Skill in adding and subtracting small numbers is best acquired by continued exercises in these inverse processes. The factor processes should be introduced later, and when introduced should be taught as inverse processes. The logical order is here the true pedagogical order.

Ends in First Lessons.

The ends to be attained in the first lessons in number are clear ideas of numbers and skill in primary number processes. To develop a clear idea of a given number, it is not necessary for the child to view it in all possible relations to other known numbers; and skill in number processes is not best attained by mixing unlike operations. Skill in any activity of body or mind is the result of repetition, and hence skill in any process or art is attained by a repetition *of the acts therein.* The mixing of unlike processes in the same exercises retards the acquisition of skill.

Objections to Method verified.

These and other fundamental objections to the Grube method of teaching number have been verified by its failure to give desired skill in number processes. School inspectors have failed to find in the third and fourth years arithmetical skill or power that could be traced back to the Grube grind of the first and second years. The method is now rapidly disappearing from the primary schools which it has so long possessed. Its exit would be more rapid and general but for the acceptance by many teachers of the pedagogical theory that justifies and encourages the mixing of as many things as possible in teaching exercises — what may be called the conglomerate theory of school training.

It may be added that the failure of the Grube method is not due to its general use of objects that have no quantitative relation or to its alleged "fixed unit." Its failure would have been as marked if the objects used had been cubic blocks or the foot rule. Its weakness is more fundamental than the objective appliances used in its processes.

When pupils have acquired the requisite skill in adding, subtracting, and comparing the digital numbers, the factor processes are easily developed and taught; first multiplication, and then division as the inverse process. It is not meant that the products of all the digital numbers two and two are to be learned before division is taught. The two processes should be taught jointly. When, for example, the product of 3 and 4 is learned, then 12 should be divided by 3 and by 4. ($3 \times 4 = 12$; $12 \div 3 = 4$; $12 \div 4 = 3$.) The essential result is the association of the product with its two factors so that the product may be discerned instantly, *without adding*, when the two factors are presented to the mind. This association of the digital numbers two and two with their products makes possible a distinct number process, called *multiplication*, and its inverse process called *division*. Addition and multiplication are differentiated as distinct processes, and hence the error in defining multiplication as the *adding* of equal numbers. The adding of equal numbers gives a *sum*, not a product. Division as a process is not subtraction.

The Factor Processes.

The existence of four number processes is shown by the fact that they are uniformly designated by separate terms. No mathematical terms are more distinct than the terms *add* and *multiply*, *sum* and *product*; *subtract*

and *divide*, *difference* and *quotient*. The part signs, + and −, and the factor signs, × and ÷, run through mathematics from primary arithmetic to the calculus, and they never indicate the same process: $a \times b$ never means $a + b$, and $a \div b$ never means $a - b$. Moreover, no time is saved by teaching all four of these processes together from the first. The best results are attained by first teaching the inverse processes of addition and subtraction, and later the inverse processes of multiplication and division.

The Four Number Processes.

CHAPTER XX.

ARITHMETIC (*Continued*).

THE ELEMENTARY COURSE.

THIS simple and natural training in number during the first two years will prepare pupils well for the mastery of *all* the fundamental processes with small numbers in the third year. The exercises should be both oral and written, the former being preparatory to the latter. The numbers used need not exceed 10,000, though the use of larger numbers the latter part of the year would not be a pedagogic sin.

Number Training in Third Year.

The chief aim of the training from the first should be to impart *rapidity and accuracy in all processes.* It should also give a clear grasp of number relations; and to this end the exercises should include a great number and variety of simple concrete problems to be solved without any attempt at a formal logical analysis. They should also include, to some extent, the measurement of lines, surfaces, and solids, the comparison of small denominate numbers, and incidentally the use of fractions, and also sums of money expressed orally and by figures. There need be no formal instruction or drills on fractions or United States money the third year. It is far better for young pupils to catch glimpses of these subjects by their occa-

Aim and Exercises.

sional use, just as they get their first knowledge of many things which they afterward know more fully.

Advantage of using Book in Third Year.

There is great advantage in the use of a manual in the third year. The use of a book by the pupils relieves the teacher from much unnecessary labor in preparing blackboard work, this being specially true in problems; and it also relieves the pupils from the necessity of copying so many exercises from the board, often a severe tax on the eyes and nerves, especially in poorly lighted rooms. A suitable manual for third year use will contain a much greater variety of concrete problems than is possible for teachers to extemporize. Much of the board work prepared by teachers as a class is characterized by marked sameness and monotony. Besides, the use of a book affords pupils an excellent practice in seeing the relations of numbers when expressed in print (p. 121).

Number Training in Fourth Year.

Pupils who reach the fourth year grade should be well prepared for a fuller development of the fundamental operations, but care should still be taken not to attempt too much in the direction of the sciences of numbers. Only a few definitions and principles should be taught, and these should be presented inductively. It should be kept in mind that pupils are still in the *skill period* of arithmetical training, and the chief purpose of the exercises should be to give desired rapidity and accuracy in computation, and increased skill in the solution of problems by analysis.

Fraction Processes.

The mastery of the fundamental operations with integral numbers should be followed by training in the more elementary phases of these operations *with fractional numbers, common and decimal.* No attempt should be made to teach these fraction processes

exhaustively. Only fractions *with small terms* should be used, and these should be treated in like manner in both oral and written exercises. The use of the greatest common divisor and the least common multiple and other formal methods should be avoided. The aim should be to make pupils skillful in the simpler and more common processes with fractions, common and decimal, this being a preparation for a more complete treatment later in the course. This systematic training in fraction processes may properly be begun not later than the opening of the fifth school year; and, since all functioning is made easy and skillful only by repetition, there should be sufficient isolation of the several processes to secure needed continuous repetition therein. Facility and accuracy in number processes can be secured only by persistent and well-guided practice.

Much stress has been laid by different authors and teachers on the place in the course in which common fractions, decimals, and percentage should be introduced, and also on the order in which they should be taught. Attempts have been made to mix decimals with integers in written exercises from the beginning, but the resulting gain has not been manifest. On the contrary, the early introduction of decimals lends no assistance to the mastery of the processes with integers or later with common fractions. Moreover, so young pupils have no occasion to use decimals, except possibly in writing sums of money, and here a child is little wiser when he learns that cents are decimal parts of a dollar. **Order of Processes.**

The natural order in which the mind gains a knowledge of these different forms and processes is (1) simple numbers or integers; (2) common fractions; (3) deci-

mals, and (4) percentage; and this is also the order in which practical experience uses them. An idea of an integer necessarily precedes the idea of a fraction, and is more easily manipulated since a fraction is expressed by *two* numbers or terms. The idea of a common fraction with both terms expressed is not so difficult as the idea of a decimal fraction with one of its two terms not expressed. The complete idea of a per-cent number is dependent on the idea of hundredths expressed decimally. These facts indicate the order in which these subjects should be *formally* treated in an elementary course. It is true that $\frac{1}{4} = .25 = 25\%$, but this equality does not make possible one and the same process. The different forms of expression occasion different processes, this being specially true of common and decimal fractions.

Natural Order.

It is claimed that the separate treatment of common fractions, decimals, and percentage in the elementary course gives pupils the notion that they have no common relation, and that this error can be avoided only by teaching them together. Is it true that pupils who take up the study of these subjects in succession, do not learn that $\frac{1}{4} = .25 = 25\%$? If so, such a result must be due to very bad teaching. It does not seem possible to give a pupil the idea of a decimal fraction without his seeing that $\frac{25}{100}$ and .25 express the same number. How is it possible to teach the meaning of 5 per cent except as 5 *hundredths?* And yet all things pedagogical are possible when stupidity in the teacher meets the routine habit in pupils.

Reason urged for Teaching Processes together.

But in order to avoid the error pointed out above, teachers are not shut up to the jumbling of all number

processes throughout the course, pupils nibbling at one and another from day to day. There are many opportunities in the elementary school to make pupils more or less familiar with simple fractions before their formal study. The writing of sums of money affords an opportunity to call attention to the decimal notation; and the idea of per cent and the percentage process may properly be introduced in connection with the multiplication of decimals. Indeed, these different number ideas and symbols frequently occur in the experience of pupils, especially after the second year, and incidental attention to them as they occur is quite sufficient to attain desired results. The child's first ideas of many things *are caught*, not learned by a formal process.

Avoidance of Error easy.

When pupils have acquired desired facility and accuracy in the fundamental processes with both integral and fractional numbers, the subjects of United States money, denominate numbers, measurements, ratio, and the elements of percentage may each receive special treatment. The time required for their mastery, to the extent presented, has been greatly lessened by the fact that they have already received more or less attention. The pupils from year to year have been made familiar with the common weights and measures, and their use in weighing different substances and in measuring liquids, grains, lines, surfaces, etc. If they have been properly taught, the terms that denote these measures are not mere words, but are the symbols of the real measures. They have also had some practice in comparing denominate numbers, in discerning what part one number is of another, etc. They are now prepared to take up these subjects sepa-

Applications of Fundamental Processes.

rately, and what is needed for the attainment of the best results is a series of exercises, oral and written, and concrete problems, — all presented with proper sequence, the whole being reviewed in miscellaneous exercises.

An important condition of success in this elementary course is *the skillful union of oral and written exercises.*

Union of Oral and Written Exercises. The first step in the learning of a new written process should be the oral solution of examples with small numbers until the mental process is clear and familiar; and this will usually require a goodly number of oral exercises. When this step is properly taken, the mastery of the written process is easy, the chief difference between the oral and the written solution being the fact that in the former results are kept in mind, while in the latter they are written on board or slate or paper. The transition from the oral to the written process may be facilitated by writing on the board the results in connection with one or more oral solutions. There should be no haste to reach the written process. Time is saved in the end by the complete mastery of the oral process before passing to the written.

It seems unnecessary to add that no written process should be taught by rule, and problems should not be solved by referring to a rule for the steps to be taken. When rules are given in an arithmetic, and this may be desirable, they should be placed *after the problems.*[1] Rules should be formed by the pupils by generalizing the written processes when familiar, thus supplementing the maxim, "Processes before

Rules.

[1] "So far as possible, rules should be derived inductively, instead of being stated dogmatically. On this system the rules will come at the end, rather than at the beginning, of a subject." — "Committee of Ten," p. 105.

rules," by the later maxim, "Rules through processes." Concrete problems should be solved by a process of reasoning, not mechanically, and it will be found an excellent practice for pupils first to solve problems by indicating the operations by the proper signs, and then performing the operations indicated. One illustration may suffice.

PROBLEM: If 3 acres of land cost $96, what will be the cost of $8\frac{1}{3}$ acres?

SOLUTION.	PROCESS.
$\$96 \div 3, \times 8\frac{1}{3} = \$$, *Ans.*	$3)\ \$96$ 32 $8\frac{1}{3}$ $\$272$, *Ans.*

It is an excellent drill, especially in reviews, for pupils to write rapidly the solution of a considerable number of problems without stopping at the time to perform the operations.

Experience shows that it will not suffice to limit the drills in analytical reasoning to the oral exercises that are introductory to the written work. These oral or mental exercises need to be supplemented in as many subjects as may be practicable by miscellaneous problems for oral *analytic solution*, a discipline that has a very important place in arithmetical training. The necessary problems for oral solution should not be in a separate manual, thus divorcing them from like problems for written solution. There are not two kinds of arithmetic, mental and written, and there is no good reason for putting problems for oral solution (with small numbers) and those for written solution in separate manuals. This makes difficult the proper correlation of the two methods of

Numerous Oral Problems needed.

solution, and it usually demands for arithmetic more time than ought to be given to the study. As the writer sees it, the continued demand for separate mental arithmetics, sometimes announced as "the mental arithmetic revival," is largely due to the failure of most school arithmetics to give a sufficient number of problems for needed analytic drill, the oral exercises being usually limited to those which are *introductory to the written work*. This has resulted in a neglect of analytic training; and, to remedy this defect, the use of a separate mental arithmetic seems to many necessary. The needed problems for oral analysis ought to be found in all approved arithmetics.

"Mental Arithmetic Revival."

It may be added that the oral solutions in the elementary course should be concise and simple. The reasoning power of children is not trained or helped by the repetition of what has been aptly called "logical verbiage." It is now seen that the elaborate logical analyses of problems, which pupils were required to give when mental arithmetic was a school hobby, were often an injury and not a help to their thinking power. Much of the glib logical analysis, once the pride of so many teachers, was the result of the worst form of rote teaching, the analyses being committed to memory by the pupils, and repeated without any wholesome exercise of the reasoning power.

Simple Oral Solutions.

Grammar School Course.

The mastery of the elementary course in arithmetic, as indicated above, ought to prepare pupils for a more scientific study of the subject. Exercises to give increased

facility and accuracy in computation should be continued, and there should be an abundance of problems for solution; but it seems to the writer a great mistake to keep pupils drilling on processes and solving miscellaneous problems during the last three years of the school course. This process training should be supplemented by a study of arithmetic *as a science*, pupils passing by easy generalizations and inductions from processes to rules, and, what is more vital, to definitions, principles, and formulas. The different subjects should be studied somewhat in their completeness, as well as in their relations to each other. No mental discipline is of higher value at this period of school training than that resulting from the proper study of arithmetic as a science.

Scientific Study of Arithmetic.

It is not meant that every subject that falls within the science of number should have a place in the grammar school course, or that all the arithmetical subjects properly included in such a course should be taught with equal thoroughness. Several of the subjects which were treated in the standard arithmetics, published forty years ago, are not included, with few exceptions, in more recent text-books designed for school use. These omitted topics include alligation, permutation, the progressions, circulating decimals, duodecimals, annuities, equation of accounts, and several others. It has recently been urged that the school course in arithmetic should be further reduced by the omission of compound numbers, compound interest, stock investments, foreign exchange, equation of payments, compound proportion, compound partnership, and cube root; and some have gone so far as to advocate the reduction of the work in

Subjects to be included in Course.

Omissions urged.

arithmetic to the elementary course outlined above, practically to the art of numerical computation.[1]

Ground for Such Reduction.

This large reduction in the course in arithmetic is urged on the ground that arithmetical training should be reduced to the needs of actual life, that is, to the facts and processes that pupils will use in after life. What a reduction in school courses of study would be made by the application of this test of value! Not one pupil in ten in the high schools will ever use in after life an algebraic equation or formula. The same is true of geometry. Indeed, there are few studies in the high-school course whose *facts* will be consciously used in life by one pupil in five. All the facts of physics which an ordinary artisan will have occasion to use in his trade, can be printed on the fly-leaf of a text-book in physics. Indeed, the test of practical utility in life's work has been rejected even by the later advocates of manual training. The truth is, the practical value of any school study depends primarily not on the *usableness* of its facts in life, but on the general utility of the power and skill acquired by their mastery.

Tests of Practical Value.

The practical value of any subject in arithmetic depends (1) on the mental training afforded by a mastery of its processes and principles; (2) the nature and extent of their use in industrial and commercial life; and (3) the value of the subject compared with other subjects that may be sub-

[1] "The cry of 'Too Much Arithmetic' is responded to by the practical exclusion of that part of the subject which so long furnished an unexampled training in logical processes and pure reasoning, the value of which can be hardly overestimated." — Dr. T. C. MENDENHALL, Proceedings of N. E. A., 1899, p. 365.

stituted for it. The intelligent application of these tests will determine the time that should be given to arithmetic in the elementary school, as well as the subjects that should be taught. It may be added that the second of these questions cannot be determined by the supposed needs of *individual* pupils. It is not possible even to guess what arithmetical knowledge or skill will be actually used or needed by a given pupil in life. The most that can be known is that some, if not most, pupils who enter into community life may need certain knowledge or skill. The fact that approaches certainty is that the mental training afforded by the study will have practical value in those duties and relations of life which may be assumed by all.

Compound Numbers.

In the light of the foregoing tests of value, it is conceded that but little time should be given to compound numbers, the exercises having practical value being largely limited to latitude and longitude and to time (difference between dates); but it is by no means a waste of time for pupils to see that the fundamental processes with compound numbers are similar to the same processes with simple numbers. It may also be conceded that when the grammar school course is too crowded, compound proportion, compound partnership, and cube root may be omitted, or deferred until arithmetic is reviewed in the high school.

Reductions in Percentage.

We now face the reductions that should be made in percentage. The "Committee of Ten" urged that "percentage should be rigidly reduced to the needs of actual life," but the committee failed to tell us *whose* actual life should be considered. As already indicated, no teacher can guess what will be the percentage needs of individual pupils

in actual life. The only feasible course seems to be to give pupils as a class such training in the principles and processes of percentage as will enable them to meet whatever needs are likely to arise in life. This is all the more important since the mastery of percentage and its more common applications in industry and business affords a fine arithmetical training of general utility, this being specially true when the elementary course in processes is followed by a more scientific study of the subject, a view entirely overlooked by the committee.

What Omissions are Feasible.

It is now agreed that equation of payments and equation of accounts may properly be transferred from the regular school course to special business or commercial courses. Whether such applications as stock investments, customs, foreign exchange, etc., should be taught, depends on the time that can be given to percentage, the ability and attainments of the pupils, and other conditions. When pupils are well grounded in the principles of percentage and its more common applications, it requires but little time to learn the processes in stock investments, customs, and foreign exchange. Besides, the widening world outlook of the United States gives increasing interest to all questions relating to foreign trade. These subjects in some form enter into nearly every election, and even "plain people" ought to know at least the meaning of the terms. One or two lessons devoted to compound interest makes possible an intelligent view of the difference between simple and compound interest, and, what is even more important, the difference between annual and compound interest. Many, if not most, notes extending two or more years are now drawn "with interest payable annually," or

"with annual interest." The pupils who complete the course in arithmetic in our schools ought to be able, with the aid of their text-book, to compute the interest due on such a note when the interest has not been paid annually, and also when payments have been made from time to time. This is the kind of interest which thousands of the pupils in our common schools must compute and pay *in after life*. Many persons are now paying illegal compound interest, because they do not know how to compute legal annual interest.[1]

Annual Interest Important.

When pupils reach the seventh school year without any previous training in the simple elements of percentage, it is clearly a mistake to attempt to teach the subject exhaustively, and it would certainly be a mistake to teach all of its applications with equal thoroughness. The most that pupils can wisely undertake the first time they go over percentage is to master the more fundamental processes and to make the same familiar by solving problems involving their simpler applications, the commercial terms in such problems being explained by the teacher, when necessary. It is not important that *beginners* study the definitions and other statements introductory to the several applications, simple interest excepted.

First Study of Percentage.

When pupils have received this elementary training in percentage, they are prepared for a more scientific and thorough study of the subject, including a classification of its fundamental processes, their representation by formulas, the development of definitions and principles, the comparison of

Scientific Study of Percentage.

[1] In several suits in Ohio the courts have cited a certain standard arithmetic as authority on the method of computing the interest involved.

the different kinds of interest, the several problems in simple interest and their representation by formulas, etc. No part of arithmetic presents better opportunities for such study than percentage; and, for pupils prepared for it, there is no finer arithmetical training. It is not too much to claim that intelligent people should have at least a general knowledge of the several applications of percentage.

Higher Text-books in Arithmetic.

It may be added that the higher text-book in arithmetic should present the subject as a science as well as an art, and with sufficient completeness for use in reviews in high schools, academies, and normal schools. It is also to be remembered that most of the teachers in our public schools obtain their knowledge of arithmetic from the text-book used in the schools, and it is evident that elementary training in processes is not an adequate preparation in arithmetic *for a teacher*. The fact that an arithmetic treats more subjects than can be properly mastered in *all* schools is not objectionable, but is desirable. The time is past when school courses actually include *all* the subjects treated in the text-books used by the pupils, and these in the exact order there presented.

Introduction to Algebra.

An Early Experiment.

In a Cleveland grammar school over forty years ago, introductory lessons in algebra took the place of mental arithmetic the second half of the eighth school year. The lessons were largely limited to the solution of problems by means of the algebraic equation (algebraic method), most of the problems thus solved being also solved arithmetically by analysis.

These lessons in algebra correlated with the training in arithmetic, and also proved a helpful preparation for the study of elementary algebra in the high school, which in those days was easily mastered in less than a year.

Since the report of the Committee of Ten in 1892, there has been quite an earnest advocacy of the teaching of the elements of algebra in grammar schools, especially in the last year of the course; and some educators have gone so far as to recommend the dropping of arithmetic at the close of the sixth school year, and devoting the next two years to the elements of algebra and concrete geometry, a recommendation that has not met with much favor. Unfortunately, those who have advocated the introduction of algebra into grammar schools have not been careful to indicate clearly the *kind* of algebraic training that should take the place of arithmetic, and this has led in several cities to the introduction of the elements of *technical* algebra in the eighth school year, the course being similar to the first half of the elements of algebra taught in the high school.

Algebra in the Grammar School.

Wrong Kind of Algebra introduced.

The result is that pupils are kept two years or more on the elements of algebra with little real gain. The testimony of teachers of algebra is to the effect that but little time is saved in the high school by the year or more of algebra in the grammar schools. In several cities pupils with a year of algebra in the grammar school enter the classes in the high school with pupils who have had no algebra but have had a year more of arithmetic; and, in a few weeks, it is found that the pupils who had algebra in the grammar school are not superior in the study to the other pupils. In one of the largest cities in the country

Testimony of Teachers.

a high-school teacher of algebra recently estimated that the year of algebra in the grammar school counted for about six weeks of algebra in the high school.

There is evident disappointment in the results of the instruction in algebra in grades below the high school; and this is due, in the writer's judgment, to the introduction of technical algebra, which has little connection with arithmetic. It is clear that technical algebra has no value that justifies its study *before arithmetic is properly completed.* The practical value of algebra below the high school is almost wholly limited to the use of the algebraic method in the solution of problems and the statement of formulas, with some resulting familiarity with the expression of numbers by letters as well as by figures. The use of the algebraic equation for these purposes, properly called rational algebra, is helpful in arithmetic and subsequently in algebra. On the contrary, little is gained in keeping pupils dawdling over the elements of technical algebra for two or three years, including a year or more in the high school. It is much better to limit the exercises in algebra in the eighth school year to the solution of two hundred to three hundred problems that may also be solved arithmetically, thus practically correlating the two methods. Any good arithmetic for grammar grades will contain several hundred problems that can be solved algebraically.

Results Disappointing.

Rational Algebra needed.

There is no good reason for the substitution of algebra for arithmetic in the seventh school year. No algebraic lessons can equal in mental discipline or practical utility in life the training possible in arithmetic the seventh year, a training superior to that of the two preceding years.

CHAPTER XXI.

GEOGRAPHY.

In the recent discussions of geographical instruction in elementary schools special stress has been put on the *order* in which the subject-matter of geography should be presented in the school course. One view asserts that the study of geography should begin with the physical phenomena of the earth's surface, and then pass from these physical facts to the industrial and other human interests which they occasion or condition. Another view reverses this order. It would begin with human interests, specially including man's industrial and commercial activities, and then pass from these facts to the physical phenomena which occasion or condition them.

Two Views as to Order.

Whether in geographical instruction the teacher should pass from causes to their effects or from effects back to their causes seems to depend on circumstances, including the nature of the phenomena and the capability of the pupils. Physical and human phenomena are so commingled at first that it does not seem possible to observe an invariable order in their presentation. Moreover, the difference of view in question relates more to emphasis than to order. One view emphasizes the physical side of geography, and the other lays special stress on the human side. Certainly geographical instruction cannot begin with the scientific study of physical phenomena. A

No Invariable Order in Elementry Geography.

causal explanation of the formation and configuration of land masses, of climate, winds, tides, ocean currents, etc., must wait for the learner to reach the scientific phase of mental development, and hence it cannot be made the initial or basal step in geographical instruction. The scientific study of physical phenomena has a small place below the seventh school year.

Subject-matter of Geography.

The discussion of the geography question has been attended by attempts to determine the subject-matter of geography by the application of philosophic theories as to the ends to be attained. The two theories that have inspired several recent experiments may be characterized by the terms *individualism* and *industrialism*. Special stress has been put upon the theory that whatever is taught in geography should have a vital relation to the interests and future needs of pupils as *individuals*. The writer confesses his inability to see how such a theory can be actually realized in school instruction. It presupposes either that the future life of a child is an open book or that teachers are endowed with sufficient prophetic insight to divine the child's future. Is there any rational ground for either of these suppositions? Who can possibly forecast even the future industrial life of a child? If this be not possible, who can tell just what geographical knowledge will best meet his future industrial needs? Not one fact in ten now included in what is called geography will ever directly touch the industrial or commercial activities of the great majority of pupils.

Individualism.

It seems evident that the basis for a course of instruction in geography can never be found in the special interests or industrial needs of pupils as individuals.

What is really covered in this theory by the blanket phrase, "the life of the child"? We are increasingly impressed with the feeling that much of the talk about correlating knowledge with the life of the individual pupil is little short of pedagogic cant. The unknown future of a child is about as uncertain a guide in school training as the uncertain guesses based on the child's complex heredity. Besides, does not all knowledge touch in some way the life of the knower?

Value of Geography.

The fundamental question in geographical instruction is not what knowledge of the earth and its inhabitants will be helpful to little John Jones in his future activities, but what knowledge and training will be useful to pupils as a class (including John Jones), not only in their outer activities, but also in their inner life. The value of geography as a school study is not measured chiefly by its industrial and commercial utility, but rather by what it does to furnish a basis for a knowledge of current world events, for the intelligent reading of history, especially contemporary history, and, above all, by what it does to train the imagination and to broaden and enrich subjective experience and enjoyment. It is a happy fact that these results are reached by essentially the same general method of instruction.

Three Courses in Geography.

It is now generally agreed that geographical knowledge presents three somewhat distinct phases, corresponding to the phases of mental development through which pupils pass as they advance in the school course, to wit: the observational or perceptive phase, the intermediate or transitional phase, and the scientific phase. The adaptation of the subject-matter and method of instruction to the capa-

bility of the pupils in these three phases gives three somewhat distinct courses, as follows:

1. *An oral course in home geography — primary ideas and facts taught objectively.*

2. *An elementary course, with the use of globes, maps, relief and outline, and text-books.*

3. *A scientific course in physical geography.*

It is now more than thirty years since the division of the course in geography into these three well-defined sub-courses was made by the writer, and it is a source of gratification that the latest studies of the geography problem confirm the wisdom of the division. It is true that the "Conference" on geography in the Committee of Ten names only two courses for elementary schools, to wit: elementary geography and physical geography, "the latter to be pursued in the higher grammar grades"; but, in the treatment of elementary geography, the Conference formally recognizes the phase called "Observation Geography," and adds the judgment that "observation should go before all other forms of geographical study and prepare the way for them." The same succession of phases of instruction is recognized, though less formally, by the Committee of Fifteen, and later by the Committee of Twelve on Rural Schools. This division is embodied in numerous courses of study, the observation course being usually called "primary" geography. While the formal study of physical geography is begun in the higher grades (upper grammar or lower high school), many of the problems of the science are now found in the introductory pages of elementary text-books, and teachers are trying to teach these problems to young pupils with small ability for scientific thought.

I. Home Geography.

Little instruction that may properly be called the teaching of geography can wisely be given to children under seven years of age. When children enter school as early as five, as in several states, there are two years of training preparatory to even home geography, two years of introductions to nature, and these made beautiful by the spirit and methods of the kindergarten. In these little nature lessons no attempt should be made to be systematic and formal, and it would be well if the idea of geography should not once enter the teacher's mind. The aim should rather be to give the children glimpses of nature "in her varying moods," opening the eye to see her sights, the ear to hear her sounds, and the heart to admire and love her beauty. In these early lessons, both the kindergarten and the primary school have found a place for nature poems and stories which interpret for the child nature's phenomena, and lend them added charm and interest. Several pages could easily be filled with quotations from poems and stories which teachers have used with happy results. But care needs to be taken not to give the infant mind false impressions of nature that may be difficult to overcome in later instruction. Scientists have criticised some of the nature lessons given in the schools *as fiction*, and it is even hinted that there are teachers who deal with fiction better than with fact, since the latter requires *accuracy!*

Early Lessons in Nature.

It may be added that in these early lessons there should be no haste to get the infant away from his little world of home. Let him observe and know its animals and birds, its trees and flowers,

Pupils' World of Home.

the sunshine, the rain, the snow, the clouds, the winds, etc., before he tries to fly beyond the horizon on the poor wings of words. This danger of haste is very real in cities where many children never see the full expanse of sky, the clouds floating in unobstructed view, the sunset; much less the earth's surface, with its natural hills, valleys, plains, streams, etc. It is true that human life here presents its manifold phenomena of interest; but the wise teacher will be on the alert to find *nature* for the child even in the crowded city. In the absence of all observations of nature even the literature of the nursery is on its nature side largely sealed to the child. It is only the story with a human setting that can, under these conditions, appeal strongly to the city child.

Nature in Cities.

The early nature lessons, thus indicated, are at best only a preparation for fruitful instruction in observational or home geography. In the third school year (second year when pupils enter school at six) should be undertaken a more systematic and thorough teaching of the primary ideas, concepts, and facts that constitute the basis of geographical knowledge; and in this instruction it should ever be kept in mind, that on the clearness and accuracy of the pupil's knowledge of these basal elements of geography will largely depend his success in its future study. The teacher's guiding aim should be, not only "to develop the power and habit of geographical observation," but also to give pupils a clear and accurate knowledge of primary ideas and facts, — to lay a sure foundation of geographical knowledge. The only way to reach the unknown is to begin with the known, not simply the

Home Geography.

Teacher's Guiding Aim.

near, but with what is actually known of the near. The pupil's passage from the world bounded by the horizon line to the great world that lies beyond, depends on his knowledge of the home world. In all these lessons in home geography, the teacher must remember that primary ideas cannot be taught by means of words (p. 35); and here is the best of opportunities to apply the maxim, "Never tell a child anything which you can lead the child to know and tell you" (p. 64).

Among the primary geographic ideas and facts to be taught clearly in these lessons in home geography are (1) position or place, direction, cardinal points; (2) distance, inch, foot, yard, rod, mile; (3) surface, level, sloping, plane, uneven; (4) surface representation by maps; (5) hills or mountains, ridges or ranges, summit or top, slopes, base, height, etc.; (6) valleys, plains, fields, forests; (7) streams of water, source, course, mouth, banks, channel, bed, branches, brooks, river; (8) pond, lake; (9) map representation of hills, valleys, streams, ponds, etc., — map of township or section of city; (10) trees, plants; (11) animals, wild, domestic; (12) birds, wild, domestic (fowls); (13) fishes, reptiles, insects; (14) rocks, soil, action of water, etc.; (15) grains, grasses, vegetables, etc.; (16) fruits, apples, peaches, etc., berries; also fruits sold in market; (17) clothing plants, (if any), building materials; (18) weather observations, fair, cloudy, temperature; (19) wind, north wind, south, east, west, storms, etc.; (20) the people, the family, home, school, etc.; (21) occupations, farm products, dairy products, articles manufactured; (22) local trade, roads, bridges, etc.; (23) races of men, individuals seen by pupils; (24) climate, the sun, position when rising

Lessons in Home Geography.

at noon, when setting — in winter, in summer, etc.; (25) the seasons, spring, summer, fall, winter, positions of sun at noon; (26) day and night, in summer, in winter, when equal; (27) divisions of the day, number of hours, clocks and watches, sundial, noon marks, etc.

The lessons outlined above inadequately indicate the instruction in home geography that may profitably be given in the second and third school years (third and fourth years when pupils enter school at five). This instruction may be followed by a few lessons on the state in which the pupils live, with map of same; and, if thought best, a few lessons on the United States. The pupils are now prepared for a study of the earth as a whole by means of globes and hemisphere maps.

Third and Fourth School Years.

It is not our present purpose to sketch the methods to be used in teaching these primary lessons. This is done quite fully in the author's "Elements of Pedagogy," pp. 271–283,[1] and it is now given with more or less completeness in other manuals, and in various courses of study. It must suffice here to add that the one principle always to be observed in teaching primary knowledge is that the mind acquires all primary ideas from things and phenomena, and not from words. It follows that the primary ideas and facts that are the elements of geographical knowledge can be taught only objectively, that is, by leading the pupil to observe objects that will occasion such knowledge.

Principle to be observed.

The attempt to embody such primary knowledge in a

[1] This syllabus of lessons has been approved by scores of the most skillful primary teachers in the country, and it has been used as the basis of instruction in methods in institutes, training classes, normal schools, etc.

book for pupils to study has always failed and must always fail, since such knowledge is not gained from language. No author has ever written, and no author will ever write a primary geography that should be put into the hands of young pupils as a means of acquiring primary ideas and facts. There is but one book from which this knowledge can be acquired, and this is bound not in pasteboard but *by the horizon line.* In the child's little world of home are all of the primary ideas and concepts of geography. It has been truly said that "the great world is but the child's world of home 'writ large.'"

No Primary Geography written.

It is not meant that this early geographical instruction should be entirely within the pupil's horizon. The facts observed in home lessons may often present occasions for imaginary excursions into the wider world, the children seeing with the mind's eye most interesting related phenomena. The stories read in these years will also open windows through which they will get glimpses of far-off lands and their inhabitants. But when the observation lessons outlined end, the pupils should have *a clear and definite knowledge of the primary ideas and facts which are the basis of geographical knowledge.*

Excursions into Wider World.

It is easy in these early years to overwork the tracing of relationships between geographical facts, and especially the facts of observation. It may be true that nothing in human knowledge stands alone, that every fact has relation to some other fact, but most of these relations exist in the minds of philosophers. Few persons see the relations, and especially the causal relations, of one tenth of the facts which they know or have known. Indeed, it is a relief to let

Relations of Facts.

much that one knows stand alone. The constant hunting for correlates does not pay either in mental power or knowledge; and, besides, too much correlating makes one's mental life a drudgery. It is certainly unwise to force infants to hunt for philosophic unities and "apperceptive centers." Most of this work in geography may wisely be left for physiographists. It will suffice for the child to see the more obvious relations of facts somewhat closely associated. Few children are philosophers.

Most teachers may find advantage in the use of an elementary geography in the latter part of the course in home geography outlined above. The maps and illustrations, as well as the text, will be helpful in passing beyond the boundaries of home. Such an elementary manual with few details will also be better than an advanced treatise in the courses mapped out in the first half of the next chapter.

Elementary Geography.

CHAPTER XXII.

GEOGRAPHY (*Continued*).

II. The Elementary Book Course.

The fifth school year should find pupils well prepared to begin the systematic study of the earth as the home of man; and, when pupils are not admitted to school until they are six, this study may be begun as early as the middle of the fourth school year.

This course should begin with a review of the preceding oral course, special attention being given to the natural phenomena observed, including the natural objects of land and water, animals and plants, farm and mineral productions, the seasons of the year, etc. If these natural objects and phenomena have been properly taught in the lower classes, the pupils will not only be familiar with their names, but, what is better, they will have clear and definite concepts of the objects. Several weeks may wisely be devoted to this review of the prior oral course.

Review of Oral Course.

This review may increasingly include exercises in which the pupils pass from known objects to a conception or image of like unknown objects, and at last reach a definition of the class of objects to which they belong. Thus from the concept hill, clearly formed and analyzed, pupils may be led to the definition, "A hill is a natural elevation of land," each term in the definition being clearly understood. From the concept hill pupils may be led to image a very high

Definitions.

hill, calling it a mountain, and then reach the definition, "A mountain is a high elevation of land." In like manner pupils may be readily taught the definition of plain, valley, island, river, lake, and other natural objects, land and water, ordinarily given in the introductory pages of an elementary geography.[1]

The first step in this process, the passing from a known object in nature to a like absent and unknown object, is not new to the pupils since this has been an interesting element in the oral course; but now the process should result in a more definite conception of the object that lies beyond the horizon. This will depend much on the teacher's skill in leading pupils to image the unseen. Pictures of the objects to be imaged will greatly assist in such instruction, and the pupils may be helped by modeling objects in sand when this is practicable. But it is clearly a mistake *to begin* the process with pictures or models when like *real* objects are within easy reach. The true order is to pass from the real object known by observation to the like unknown object that lies beyond the horizon of sense, and it is in imaging the absent object that the picture is most helpful. In cities pupils often get their first conceptions of objects in nature from pictures, but such conceptions are necessarily lacking in the element of reality.

Imaging Unseen Objects.

In these introductory lessons no attempt should be made to teach the definitions of mathematical terms or to give formal explanations of the change of seasons, the changes in the relative length of day and night, etc. It is not possible to give astro-

Mathematical Terms.

[1] For somewhat detailed methods of teaching the definitions of these natural objects, see "Elements of Pedagogy," pp. 283–286.

nomical explanations of these phenomena to so young pupils, and such instruction should be deferred until the higher course in geography is reached.[1]

But by means of a globe pupils can easily be taught the shape of the earth, to name and locate parallel and meridian lines, the equator, the tropics, the polar circles, the poles, the zones and their boundaries, etc. They can also be given a general notion of the climate of the several zones, and their characteristic productions, plants, and animals; and this may be followed by lessons on the continents and oceans, their comparative size, their zone belts and climates, the mountain and river systems of the continents, their great plains, their peninsulas and outlying large islands, their indenting seas, gulfs, and bays, etc., special attention being given in all this globe instruction to those striking characteristic features which may always appear in memory when the mental pictures of earth, continent, or ocean is reproduced.

Lessons on Globe.

These lessons on the globe should be reviewed by the use of a good outline map of the world,[2] which, for class purposes, is much superior to a globe, the latter being too small for successful class use. There should, however, be frequent references to the globe, and the individual pupils should handle and observe it. The map of the world takes true form

Lessons on Outline Map.

[1] We seldom witness an attempt to explain the change of seasons or the changes in the relative length of day and night to young pupils in which error is not taught. It is better to teach the simple facts of observation, and leave their scientific explanation to teachers in higher grades.

[2] If the school is not supplied with a good outline map, the teacher may find it necessary to draw such a map on the blackboard or on paper. An accurate map for this purpose may be made by means of a stencil map which can be readily secured for the purpose.

when it is seen to represent the surface of the globe. It is a good plan to conduct these exercises with a good outline map *before the class*, the chief purpose being to form in the pupil's mind a distinct image of the earth's surface; and it will be a most valuable result if these mental images are faithful reproductions of the earth pictures of the globe and the map. The writer has retained all these years the power to reproduce at pleasure the mental pictures of the earth and its grand divisions of land and water formed in early childhood by the study of globes and maps. No other geographical acquisition has been of equal practical value. He has always found it easy to pass from the clear mental image of the map to the conception or picture of the real country thus imaged, to pass from the map image to a conception of the country itself. It is believed that this is the common experience of those who obtained in childhood clear mental map images.

Mental Map Image.

The oral instruction and map drills, indicated above, should now be reviewed by the study of the introductory lessons in the text-book. If these book lessons are properly assigned, the study of the text will broaden and clarify the pupil's knowledge. It is always easy to omit those portions of the text for which pupils are not yet prepared, and which can best be learned later in the course. The class exercises should be searching tests, whether reviewing important facts and definitions or the pupil's knowledge of the earth as a whole. The knowledge thus reviewed is fundamental, and the teacher's tests should be searching and thorough.

Lessons in Text-book.

THE STUDY OF GRAND DIVISIONS.

The pupils should now be well prepared to undertake the systematic study of the several grand divisions, including their physical features and also their political divisions, cities, etc. There is a difference of opinion as to the order in which the two grand divisions of the western continent should be studied, but there is a general agreement that South America is the simpler for study, the only drawback being its Spanish and Portuguese names. This difficulty is, however, more than offset by its regular form and striking configuration. Fifth year pupils find little difficulty in getting a definite conception of its bold physical features and phenomena, including its form and coast line, its mountain and river systems, its vast plains, its chief cities (seacoast and inland), its commerce, its zones, its prevailing winds, etc. The Andes present features of special interest, and the location of such cities as Bogota and Quito is full of suggestion.

South America.

Many teachers, however, prefer to begin with the home grand division passing from its physical features to its political divisions, large cities, and its throbbing commercial and industrial life. The study of the political divisions of North America properly centers in the United States, its most important country and one of special interest to American youth. Teachers of geography differ as to the time which, at this stage, should be devoted to a study of the United States. A large amount of time may be given to the study of the states and territories separately, including their boundaries, areas, cities, productions, industries, commerce, etc. It is believed to be better to

North America.

United States.

study the states in groups or sections, with comparatively little attention to their separate study, the home state possibly excepted.

Having acquired a general but definite knowledge of the western continent, the pupils are prepared for an intelligent study of the eastern continent, and Australia. It is not necessary at this stage to study Europe, Asia, and Africa in the light of their historical, commercial, and industrial relations to the United States, and hence the order in which they are taken up is not important. It will usually be found best to follow the order of the text-book used.

Eastern Continent.

The pupils have already acquired a general conception of the more important physical features of each grand division, and the present purpose is to make this conception fuller and more definite. To this end, not only the physical features but the political divisions must receive attention; and, while it is not feasible to study the several countries exhaustively, their more important characteristic facts should be taught. But it is not our purpose to attempt to determine what knowledge should be acquired in the study of a grand division, but rather to indicate the successive steps that should be taken in such study, wishing to be as definite and helpful as possible.

Physical Features and Political Divisions.

Successive Steps.

1. The first step in the study of a grand division is the interpretation of the map, — *map reading*. In this step the pupils should be told nothing which they can be led to discover from the map. In

Map Reading.

this study it will be well to follow a definite order in taking up the several features.

2. The next step is to fix the facts discovered, and to learn other facts by drawing the map progressively, tracing features as they are studied, — *map drawing*. This will necessitate close observation, and will result in a more definite mental picture of the grand division. Since accuracy is essential, it is recommended that the pupils use faintly traced contours in drawing outlines, filling in details as learned. Form and relief features may also be molded in sand. Map Drawing.

These two steps may often be taken together, the map drawing accompanying the study and interpretation of the map. Nothing should be drawn that does not represent facts known by the pupil. The map drawn by the pupil should represent his knowledge.

3. This oral study of a grand division from the map and its reproduction should be followed by *review drills* in which the pupils should state in proper order the facts learned. This review may be made from a map drawn on the board or paper by means of a stencil, or, what is better, from a good outline wall map. It is not enough in this review that pupils point to and name the objects represented on the map. They should also state what they know of each object, the facts which make up the concept denoted by the name. It is true that this will require definite knowledge, but this ought to be the result of prior study and instruction. The map questions in the book (if any) should be used only *after* the map has been thus studied and reviewed, that is, in the final review. Review Drills.

4. The last step is the study of the *descriptive text*,

followed by searching tests of the pupil's mastery of the same. The lessons should be so assigned as to secure intelligent study, and no portion of the text, definitions excepted, should be committed to memory or be recited by repeating the author's language. Only the more important facts should be called for. Special topics prepared by the teacher may guide the pupils both in study and in reciting, but general topics should not be used (p. 109). The final test is for pupils to recite from the map which is in their mind's eye.

Descriptive Text.

MAP DRAWING.

We are thus led to a consideration of map drawing as an element in geographical training. Forty years ago map drawing was taught in many schools, especially in cities, as an *art*, and much time was devoted to the making of accurate and finished maps, the same being more or less faithful copies of the engraved maps in the geographies. In some schools these maps were drawn by means of lines of latitude and longitude, not only coast lines and other boundaries being thus determined, but the location of internal details. The pupils by practice acquired great skill in this work, and finished maps, with the details of the engraved maps copied, were conspicuous in all exhibits of pupils' work. The "art" of drawing maps became a hobby in many schools.

Map Drawing as an Art.

This copying of maps was succeeded by the drawing of maps *from memory*, and several systems of map drawing were devised, and manuals representing the same were published and exploited. These systems were

usually based on "construction lines" to determine outlines, these lines being geometrical figures, as triangles and rectangles. Much time was spent by pupils in acquiring the ability thus to draw maps from memory; and, in the examinations in geography, it was quite common to assign the drawing of the map of a state or country as one of the important tests. This was attended in some schools by the production of maps in water colors, and daubs of color, called maps, were often hung on the walls of schoolrooms as evidence of the pupils' skill, and also as an encouragement to effort.

Map Drawing from Memory.

In these successive phases of map drawing, skill in the art of map making was the conscious end of effort, the true purpose of map drawing as an aid in geographical study being almost wholly overlooked. But it slowly dawned on the more thoughtful teachers that map drawing as an art has small practical value, and that it has even less value as a means of art training, the time being much more profitably spent in teaching drawing as a general art. This view was strengthened by the introduction of drawing into the schools, since this gave teachers the opportunity to compare drawing as an art with map drawing. The result was a general discontinuance of the drawing of maps by copying or by means of "construction lines" and the gradual substitution of free-hand map drawing, more properly described as "an off-hand drawing of maps with few details." The maps thus drawn have their use as *illustrations* of the more striking features of the countries studied, but they are usually so imperfect in outline that they blur the mental maps acquired by pupils in the

True end of Map Drawing.

Free-hand Map Drawing.

study of accurate maps. The fact that these off-hand sketches lack the essential features of a map, to wit, *accuracy of outline*, led to the use of stencil maps by teachers, and stencils or, better, faintly traced outlines by pupils.

The writer used this device in a large city with hundreds of teachers and thousands of pupils, and it was found to attain well the true ends of map drawing. It aided the pupils in the accurate observation of the map studied, and also helped to fix in the memory the characteristic features of the continent or country. The traced outlines used by the pupils located few details, but these, after the contour was progressively drawn, were filled in *as they were learned in the study*. The maps thus drawn were accurate in outline and more or less accurate in details, much more accurate than maps otherwise drawn, the slow process by lines of latitude and longitude excepted.

Use of Traced Outlines.

An experience of two years showed that the use of these traced outlines secured the important purposes of map drawing *as an aid to map study* with much less waste of time and effort than other methods. It made the drawing of maps a *means*, and not an end, and the pupils became increasingly skillful in map reading, which seems more important than skill in map drawing. An essential thing in the use of traced outlines is the securing of a critical observation of coast lines and other boundaries *before they are drawn* and *as they are drawn*, otherwise the drawing of the outlines may be a purely mechanical process with little geographic value.

Value of Traced Outlines.

Enough has been said to show that map drawing is a school exercise which is easily overdone. It is, indeed, always overdone when it does not aid the pupil

in gaining a clear conception of the features of the country represented by the map studied and drawn. As an art it has small practical value. There has been an immense waste of time in the schools in the drawing of maps for the sole purpose of making pupils skillful in the art as an end.

Map Drawing overdone.

GENERAL REVIEW BY COMPARISON.

The several courses of instruction and study, outlined in the foregoing pages, should give pupils not only a fair knowledge of local and political geography, but also a knowledge of the physical features and phenomena of the earth of great interest and value. These physical facts have been learned one by one in the study of separate portions of the earth, and little attempt has been made to reduce them to scientific form, this being reserved in good part for physical geography. But, without waiting for their more scientific study, many of these facts may be brought into closer touch and relation by a *comparative study* of different sections of the earth. Indeed, it is only by such comparisons that the relation of these facts to the development and life of man can be clearly seen.

Comparative Method

The writer once outlined a series of these comparative studies for the pupils in the eighth grade in a large city, and the results were very satisfactory. Both teachers and pupils found an interest in the review which had previously been wanting in the re-study of continents and countries successively and in isolation, as presented in the text-book.

An Experiment.

We sketch below a few of these comparative lessons, in full confidence in their geographic value if properly presented.

Comparative Lessons.

Compare (1) Greenland and Cuba; (2) Iceland and Sicily; (3) the British and Japanese islands; (4) Korea and Nova Scotia; (5) the Scandinavian and Spanish peninsulas; (6) Alaska and Kamchatka; (7) Italy and the Malay peninsula; (8) Alaska and the Scandinavian peninsula; (9) Arabia and Spain; (10) The West Indies and the Philippine Islands; (11) Korea and Denmark; (12) Melville and Yucatan peninsulas; (13) the New England States and Texas; (14) Illinois and California; (15) Michigan (southern peninsula) and Florida; (16) Canada and Mexico; (17) California and Chile; (18) United States and Brazil; (19) United States and Europe; (20) Australia and Europe; (21) China and Russia; (22) China and the United States; (23) India and Canada; (24) France and Argentina; (25) the Mississippi and the Amazon; (26) the Nile and the Ganges; (27) the Thames and the Tiber; (28) South America and North America; (29) South America and Africa; (30) North America and Africa; (31) the Western and the Eastern continents; (32) Atlantic and Pacific oceans; (33) Atlantic and Indian oceans; (34) North Temperate and South Temperate zones; (35) Torrid and North Temperate zones; (36) North Frigid and South Frigid zones; etc.

Assignment of Comparative Lessons.

In assigning these lessons the teacher should indicate by special topics the comparisons to be made. For example, "Compare Spain and Arabia with respect to (1) location; (2) size; (3) contour; (4) surface; (5) latitude; (6) climate; (7) rain; (8) productions; (9) people." In assigning topics special pains should be taken to select those that include facts that can be discovered from the map, or learned from the text-book if not already known. The use of

the same topics in all the lessons will result in a great waste of time, as well as in indefinite results. If pupils are referred to cyclopedias for facts, the reference should be so definite that little time need be wasted in finding the desired information. It is to be kept in mind that this is *review work*, and the cyclopedia has a small place. It is easy in geographical instruction to overload the pupils with facts whose special value is the facility with which they are forgotten! These comparative studies will make pupils more or less familiar with physical phenomena which will be presented in a more scientific manner in physical geography.

This general review may properly end with a careful study of what is known as mathematical geography; and also of those elements of physical geography included in the introductory pages of most modern geographies designed for use in grammar schools. This study should include the definitions of mathematical terms and a simple explanation of such physical phenomena as the change of seasons, changes in the relative length of day and night, the distribution of rain, the location of desert regions, the influence of prevailing winds, the influence of climate on plant and animal life, the tides, ocean currents, etc., phenomena which have been made somewhat familiar in the study of the continents, oceans, zones, etc. It will not be found difficult to give eighth year pupils a general idea of the causes at work back of these phenomena, but it may be difficult to lead them to see how these causes operate, the *modus operandi* of their action. Pupils may, for example, learn that the tides are caused by the attraction of the sun and the moon without seeing *how* such

Mathematical and Physical Geography.

Tides.

attraction actually produces the tides.[1] Even eighth year pupils are not ready for a scientific explanation of all physical phenomena. It is feared that too many of these pupils may be trained to repeat words without knowledge.

III. Course in Physical Geography.

Reference has been made to the recommendation of the Committee of Ten that physical geography be pursued in the upper grammar grades. There seems to be no general acceptance of this recommendation. Physical geography as a separate study was first introduced into the lower classes in high schools, and this is still the general practice, notwithstanding the recent pressure to push high-school studies down into grammar grades.

Physical Geography in High School.

Twenty years ago the writer was of the opinion that the study of elementary geography could wisely end with the seventh year of school, and that the eighth year could be more profitably given to an inspiring study of physical geography. He had not then seen clearly the great value of a review of elementary geography by the comparative method, a review that so admirably prepares the way for the scientific study of physical geography. When pupils enter school at five years and the elementary school course covers a period of nine years, physical geography may wisely be studied in the last year in the gram-

Place in School Course.

[1] It is believed that few teachers of physical geography know *how* the attraction of the sun and moon produces tides. The writer has found few geographers who could explain why there are no perceptible tides in the Black and Caspian seas and the great lakes of North America. The explanation of the tides in most text-books is faulty.

mar school course, the *ninth* school year; but when pupils enter school at six years of age and the elementary course covers a period of only eight years, physical geography properly falls in the first year of the high school, which is the *ninth* school year, as above.[1] The ninth school year seems to be the proper time for the study of physical geography in graded schools. Of course, much depends on what is included in the science. The elements of the subject, presented in a simple manner, can be mastered without special difficulty in the eighth school year, while a more advanced treatment designated by the somewhat indefinite term, physiography, would be too difficult for even the ninth year.

Ninth School Year.

This suggests the importance of a clear understanding as to what is included in the science known as physical geography. We use the term herein to denote the science of the earth's physical phenomena as developed by Ritter and Guyot and embodied in the several excellent manuals now used in American schools, more generally in high schools. Physical geography as thus known is a scientific treatment of the physical features and phenomena of the earth, including its land masses, oceans, atmosphere, climate, and the forms and distribution of life. It presents known physical facts in orderly groupings, with statements of the causes of the phenomena to which they relate. When

Nature of the Science.

[1] In the discussion of this question the fact has been generally overlooked that the *ninth* school year is in several states the last year in the grammar school, while in other states the ninth school year is the first year in the high school. If Latin, Algebra, and Physical Geography are begun in the ninth school year, in some schools they will be begun in the grammar school, in others in the high school.

properly taught, physical geography has been an attractive and fruitful study.

It is evident that there are no fixed limits to such a science. Physiographers are engaged in an earnest investigation of "the physical environment of man," and new facts are being discovered and old facts explained. These facts seem so simple to those who have devoted years to their study, that no reason appears to them why they should not at once be taught to the children in the schools. It should, however, be kept in mind that the elements of other physical sciences must have a place in the high school; and that this wealth of subject-matter requires careful limitation in school instruction. There is danger of overcrowding the school course in geography.

No Fixed Limits.

It may be added that the successful teaching of physical geography requires not only a good text-book, but other adequate teaching appliances, such as physical maps, globes, charts, photographs, lantern and lantern slides, models, etc. It goes without saying that the pupil's success will depend largely on the power and habit of accurate observation which he brings to the study. Memoriter work in such a study is failure.

Teaching Appliances.

CHAPTER XXIII.

OTHER BRANCHES.

In the eight preceding chapters the principles of teaching have been practically applied in methods of teaching three of the fundamental school arts, to wit: reading, language, and number, and one knowledge branch, geography. It must suffice in this closing chapter to give a few suggestions as to the teaching of other branches.

Biography.

There seems to be a general agreement that biography has properly an earlier place in school instruction than history. The life of a person appeals to the interest of a child much earlier than the life of a nation or people. Instruction of a most vital character may be given to children by means of the life stories of individuals who have been conspicuous in the progress of the race. Such instruction has an almost continuous place in the elementary course. But it is not clear that biography can be made a regular study during the fifth and sixth school years as a preparation for history, as has been suggested. Biography that is a part of history is best presented in connection with historic events, as will be shown later. Historic characters are usually best seen in their historic setting.

Earlier Place than History.

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When biography is taught in advance of history, no attempt should be made to force it to teach history.

Relation to History.

History proper records the events in the development of national life;[1] and it is difficult to lead children to see the life of a nation or a people in the life of an individual. This is especially true of people who are separated by caste into distinct classes with few common life elements. One of the most intelligent superintendents of the country told the writer that his teachers were able to get little historic knowledge out of the biographies that were made a part of the course of study. They were obliged to study the history of each country represented, and then teach the historic facts thus learned *into the biographies*. It would seem better to let biography tell its own story, with its historic side lights. In due time the pupils must do what their teachers do, to wit: go to history for historic knowledge. It is not meant that biography throws no light on history. On the contrary, the life of a historic character may disclose important events in the life of a nation.

Our next suggestion is that biography should afford pupils early training in getting information from books;

Book Training.

and, in grammar grades, biographical knowledge should be obtained largely in this way. Preparatory instruction may be needed to interest pupils in the person whose biography is to be studied, and also to indicate the facts in his life most important to know; but pupils should be sent increasingly to books for the life stories with which they are to become familiar.

[1] "While biography narrates the career of individuals, civil history records the career of nations." — Dr. W. T. HARRIS in "Report of Committee of Fifteen."

UNITED STATES HISTORY.

The history of the United States may be systematically studied in the seventh and eighth school years, with earlier introductory lessons. The first year of the course, in which the periods of discovery, settlement, and colonization are studied, will contain a considerable element of biography. This early history of the country abounds in heroic deeds and perilous adventures, which shed light upon the historic record. The text-book in history should be supplemented by brief manuals of biography to be read by the pupils. Due attention should be given to the location of events by means of maps. This is readily accomplished by the use of stencil maps drawn on the board and traced outlines to be filled by the pupils.

First Year's Course.

The first year in history may thus be made an excellent preparation for the study of the history of the *nation*, beginning with the successful struggle for independence and the organization of the national government.

The study of history presents an opportunity for the needed training of pupils in book mastery; next to reading, the best opportunity in grammar grades. History is a systematic record of events in the progress of nations and peoples, and it is only by studying this record that a knowledge of past history is learned. The key to recorded history is the ability to obtain accurate knowledge from the printed page, and, to this end, it is important that pupils be trained in the study of historic manuals. An important aim in teaching history in the

Training afforded in Book Mastery.

grammar school is the guiding of pupils in such book study. Much must be done by the teacher in the way of preparing pupils for the successful study of books, but nothing should be done that relieves them from the task of getting historic knowledge from the printed page. History is the one study *par excellence* to give pupils in the upper grammar grades effective training in book mastery.

It is not meant that there should be no oral instruction in history. On the contrary much oral instruction will be needed to prepare pupils for successful book study; and, besides, the text-book used will need to be supplemented by oral lessons, as well as by graphic illustrations, such as engravings, chromos, lantern-slides, etc.

Whatever may be the subject-matter of history taught in elementary schools, special pains should be taken to give pupils clear and definite historic conceptions. It is surprising that so many pupils study history without really knowing "what it is about." A young girl lost in Greek history, when asked for the reason, replied, "It is all Greek to me."

Historic Conceptions.

This discloses a real difficulty in teaching history to children. The events narrated lie outside of their experience. Historic conceptions have a large content, too large for young minds to grasp and handle. It is for this reason that the history of a *people* is more readily understood by the young than the record of governmental or state affairs. Hobbes's conception of the state as a Leviathan, endowed with individuality and organized self-activity, suggests the difficulty of the child in grasping a true notion of the state or nation. A conception of the state as a "colossal man," or even

as a "collective man" is high thinking for a child. The state is too often the "unknown god" of which the young pupil gets at best only uncertain glimpses.

Civics.

It is a question whether a methodical study of civics should be undertaken below the high school or, more definitely, below the ninth school year. It is true that there are many facts relating to government that lie in the experience and under the observation of children. They are the subjects of parental control (or ought to be) and of the authority of the school as personified immediately by the teacher and more remotely by the principal, the superintendent, and the school board. If they live in the city, they become familiar with government as concretely represented by the policeman, and more vaguely by other city officials as the mayor, the police judge, etc. If they live in the country, they may at least hear of the constable and the justice of the peace. In these and other ways, children come in touch with authority, and, with proper instruction, they will come to know many facts that belong to the observational phase of civil government. It is, however, doubtful if anything is gained by early attempts to make these facts the basis for a formal study of state and national governments. The pupils will be better prepared for such instruction later in the course.

Civics below High School.

We are aware that this early instruction in civil government is urged on the ground that it is a preparation for citizenship; and, since many pupils do not remain in school to the last year in the grammar course, it is important that instruction in

Early Instruction in Civics.

civics be given early. It is easy to claim too much for the value of such early instruction. The knowledge thus acquired by children is too indefinite to be abiding; and, besides, less than half of the pupils in the grammar schools of the country will ever cast a ballot or otherwise actually participate in government affairs. It is conceded that all intelligent persons, whether men or women, should have a general knowledge of the government under which they live; but it does not follow that, to this end, civics must be formally taught to children. They may learn from time to time *facts* respecting local and state government, the duties of citizens, etc., but anything like a systematic study of civil government cannot well be undertaken below the high school.

Study of National Government.

It is generally agreed that the study of the national government should be begun in connection with United States history. The organization of the government and the subsequent adoption of the Constitution afford an opportunity for the pupils to obtain an intelligent view of what may be called the mechanism of the government, including its three departments, — legislative, executive, and judicial, — the manner in which they are severally constituted, and their general duties. But experience shows that there are many questions on the very face of the constitution that are beyond the ability of even high school pupils, — to say nothing of the theory of government, including the origin and nature of the state, the principle of sovereignty, the theory of the separation of the powers, etc.[1] The limitations of the ability of pupils in elemen-

[1] It was the writer's duty for several years to teach the United States Constitution to successive senior classes in college. There were students in even these classes who were not equal to the study.

tary schools should always be considered in determining the subject-matter of instruction. Nearly every school study has phases that correspond to the successive phases of mental development.

Economics.

The introduction of the study of economics in elementary schools has few advocates among those who are students of the science, and especially those who have had experience in teaching the subject in college or university. There are two objections to the attempt to teach the subject below the high school. These are (1) the small value of what can be taught to elementary pupils, and (2) the small number of elementary teachers who are competent to teach even the elements of the science. In support of the first objection it may be said that not a few of the so-called essential principles of the science are based on unproved assumptions or are generalized from partial and insufficient data. It is difficult to present a theory of wealth or money or taxes or wages that is not called in question by students of economics. Many of the commonplaces given in elementary manuals for schools are not true under all economic conditions. Moreover, all that will be of any practical value to so young pupils can be taught best incidentally, and usually in connection with related historic events. The second objection is not likely to be removed by institute instruction on the subject. It has been wisely said that no teacher ought to undertake this work "who has not had some training in economic reasoning."

Objections to Study below High School.

It is believed to be wiser to leave instruction in even

the elements of economics to the high school, and the development of the science to the university. Controverted subjects, which are often political questions, may wisely be left to the press, to the platform, and to economic theorists. It is not possible to settle all vital questions by the instruction of children in the public schools.

Elements in High School.

Physiology.

It has widely been assumed by those who arrange elementary courses of study that a knowledge of anatomy and physiology is of vital importance, and that the earlier this knowledge is taught to children the better. These assumptions are urged with all the assurance that would be befitting if they were axioms of school training; and, so far as we are aware, they have rarely been questioned. It seems to be believed that there is health-giving power in a knowledge of the structure and functions of the organs of the human body, a belief that has put instruction in physiology in nearly all grades of school.

Assumptions of School Course.

It may look like presumption for the writer to express the belief that a knowledge of the structure and functions of the internal organs of the body is of no practical value to young children. Necessary hygienic information may be taught to children long before they can comprehend the physiological reasons for the facts learned. The practical rules relating to cleanliness, pure air, exercise, sleep, posture, temperance, etc., can be effectively taught children in advance of anatomy. Besides, the true aim of such instruction in the lower grades of school is to train chil-

Anatomy not a Child's Study.

dren *in hygienic habits*, in a proper observance of the laws of health. What is vitally needed in all this training is a realization of the fact that hygiene is *an art to be practiced*, not a science to be studied. Good health is a vital end in school training.

Anatomy of the Vital Organs.

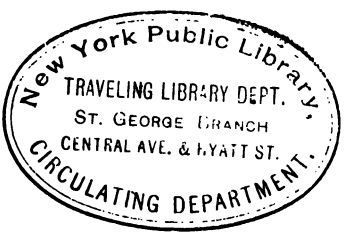
We have long been of the opinion that anatomy, especially the anatomy of the *vital organs*, should not be taught to children under twelve years of age, an opinion that has been strengthened by experience and observation.[1] This view involves the fear that early instruction may result in habits of introspection, and thus interfere with the normal action of the vital organs and disturb vital processes, this being a certain danger in the case of children who are morbidly sensitive. This evil is aggravated by the use of charts and models as illustrations, particularly those that represent diseased conditions of certain organs, as the brain, heart, and stomach. Anatomical charts are in use in some rural schools, with pupils five years old and upwards, that ought not to be shown to young children. A knowledge of the structure and functions of the vital organs has no value to children that justifies the early introduction of these subjects into the school course.

Book Study.

The systematic study of physiology properly falls in the two upper grammar grades, when a good manual can be used with advantage. All instruction in physiology and hygiene of practical value in lower grades can best be taught orally. The use of a manual, when the systematic study of the science is undertaken, will afford an excellent opportunity for

[1] "Elements of Pedagogy," p. 158.

giving grammar pupils needed training in the art of gaining knowledge from books. To this end, the pupils must be properly prepared for book study by oral instruction and observation; and, to secure such study, they must be held by searching recitations to the mastery of assigned lessons.


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